

**Final  
Site-Specific Field Sampling Plan,  
Site-Specific Safety and Health Plan, and Site-Specific  
Unexploded Ordnance Safety Plan Attachments  
Former Tank Ranges, Parcels 92Q-X and 93Q-X  
Former Grenade Range, Parcel 107Q-X, and  
Impact Areas, Parcels 133Q-X and 134Q-X  
Fort McClellan, Calhoun County, Alabama**

**Task Order CK10  
Contract No. DACA21-96-D-0018  
IT Project No. 796887**

**January 2002**

**Revision 0**



**Final  
Site-Specific Field Sampling Plan Attachment  
Site Investigation at Former Tank Ranges, Parcels 92Q-X and  
93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact  
Areas, Parcels 133Q-X and 134Q-X  
Fort McClellan, Calhoun County, Alabama**

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**Task Order CK10  
Contract No. DACA21-96-D-0018  
IT Project No. 796887**

**January 2002**

**Revision 0**

# Table of Contents

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	<b>Page</b>
List of Tables .....	iii
List of Figures .....	iv
Executive Summary .....	ES-1
1.0 Project Description .....	1-1
1.1 Introduction .....	1-1
1.2 Site Description .....	1-1
1.2.1 Archive Search Report Ranges .....	1-5
1.2.2 Aerial Photographs .....	1-7
1.2.3 Soil Descriptions .....	1-8
1.3 Scope of Work .....	1-9
2.0 Summary of Existing Environmental Studies .....	2-1
3.0 Site-Specific Data Quality Objectives .....	3-1
3.1 Overview .....	3-1
3.2 Data Users and Available Data .....	3-1
3.3 Conceptual Site Exposure Model .....	3-2
3.4 Decision-Making Process, Data Uses, and Needs .....	3-3
3.4.1 Risk Evaluation .....	3-3
3.4.2 Data Types and Quality .....	3-4
3.4.3 Precision, Accuracy, and Completeness .....	3-4
4.0 Field Activities .....	4-1
4.1 UXO Survey Requirements and Utility Clearances .....	4-1
4.1.1 Surface UXO Survey .....	4-1
4.1.2 Downhole UXO Survey .....	4-1
4.1.3 Utility Clearances .....	4-1
4.2 Environmental Sampling .....	4-2
4.2.1 Surface Soil Sampling .....	4-2
4.2.1.1 Sample Locations and Rationales .....	4-2
4.2.1.2 Sample Collection .....	4-2
4.2.2 Subsurface Soil Sampling .....	4-3
4.2.2.1 Sample Locations and Rationales .....	4-3
4.2.2.2 Sample Collection .....	4-3
4.2.3 Permanent Residuum Monitoring Wells .....	4-4



## **Table of Contents** (Continued)

---

	<b>Page</b>
4.2.4 Groundwater Sampling.....	4-5
4.2.4.1 Sample Locations and Rationales .....	4-5
4.2.4.2 Sample Collection.....	4-5
4.2.5 Surface Water Sampling.....	4-5
4.2.5.1 Sample Locations and Rationales .....	4-6
4.2.5.2 Sample Collection.....	4-6
4.2.6 Sediment Sampling.....	4-6
4.2.6.1 Sample Locations and Rationales .....	4-6
4.2.6.2 Sample Collection.....	4-6
4.3 Decontamination Requirements .....	4-6
4.4 Surveying of Sample Locations.....	4-7
4.5 Analytical Program.....	4-7
4.6 Sample Preservation, Packaging, and Shipping .....	4-8
4.7 Investigation-Derived Waste Management .....	4-8
4.8 Site-Specific Safety and Health.....	4-9
5.0 Project Schedule.....	5-1
6.0 References .....	6-1

### Attachment 1 – List of Abbreviations and Acronyms

## **List of Tables**

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<b>Number</b>	<b>Title</b>	<b>Follows Page</b>
3-1	Summary of Data Quality Objectives	3-1
4-1	Sampling Locations and Rationales	4-2
4-2	Surface and Subsurface Soil Sample Designations and QA/QC Sample Quantities	4-2
4-3	Groundwater Sample Designations and QA/QC Sample Quantities	
4-4	Surface Water and Sediment Sample Designations and QA/QC Sample Quantities	4-6
4-5	Analytical Samples	4-8

## **List of Figures**

---

<b>Number</b>	<b>Title</b>	<b>Follows Page</b>
1-1	Site Location Map	1-1
1-2	Site Map	1-1
1-3	ASR Plate 3 (World War I Use) Range Location Map	1-5
1-4	ASR Plate 4 (Inter-War Use) Range Location Map	1-5
1-5	ASR Plate 5 (World War II to 1950) Range Location Map	1-5
1-6	ASR Plate 6 (1950 to 1973) Range Location Map	1-5
1-7	1940 Aerial Photograph	1-7
1-8	1944 Aerial Photograph	1-7
1-9	1961 Aerial Photograph	1-7
1-10	1969 Aerial Photograph	1-8
1-11	1973 Aerial Photograph	1-8
1-12	1998 Aerial Photograph	1-8
3-1	Human Health Conceptual Site Exposure Model	3-3
4-1	Proposed Sample Location Map	4-2

## ***Executive Summary***

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In accordance with Contract Number DACA21-96-D-0018, Task Order CK10, IT Corporation (IT) will conduct site investigation activities at the Former Tank Ranges, Parcels 92Q-X and 93Q-X; Former Grenade Range, Parcel 107Q-X; and Impact Areas, Parcels 133Q-X and 134Q-X, at Fort McClellan, Calhoun County, Alabama, to determine the presence or absence of potential site-specific chemicals at this site. The purpose of this site-specific field sampling plan is to provide technical guidance for sampling activities at the Former Tank Ranges, Parcels 92Q-X and 93Q-X; Former Grenade Range, Parcel 107Q-X; and Impact Areas, Parcels 133Q-X and 134Q-X.

IT will collect 36 surface soil samples, 36 subsurface soil samples, 10 groundwater samples, 7 surface water samples, 8 sediment samples, and 1 seep sample in this investigation. Suspected potential contaminant sources at the Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X, are primarily unknown but may include explosive compounds and metals. Chemical analyses of the samples collected during the field program will include metals and nitroaromatic/nitramine explosives. In addition, 10 percent of the samples will be analyzed for volatile organic compounds, semivolatile organic compounds, chlorinated and organophosphorous pesticides, and chlorinated herbicides. In addition, sediment samples will be analyzed for total organic carbon and grain size. Results from these analyses will be compared with site-specific screening levels, ecological screening values, and background values to determine if potential site-specific chemicals are present at the site at concentrations that pose an unacceptable risk to human health or the environment.

Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X, fall within the “Possible Explosive Ordnance Impact Areas” shown on Plate 10 of the U.S. Army Corps of Engineers *Archives Search Report, Maps, Fort McClellan, Anniston, Alabama*. Therefore, unexploded ordnance (UXO) surface sweeps and downhole surveys of soil borings will be required to support all site investigation field activities. Surface sweeps and downhole surveys will be conducted to identify anomalies for the purpose of UXO avoidance.

This site-specific field sampling plan attachment to the installation-wide sampling and analysis plan (SAP) for Fort McClellan will be used in conjunction with the site-specific safety and health plan, the site specific UXO safety plan, the installation-wide work plan, and the SAP. The SAP

includes the installation-wide safety and health plan, waste management plan, ordnance and explosives management plan, and quality assurance plan. Site-specific hazard analyses are included in the site-specific safety and health plan.

## **1.0 Project Description**

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### **1.1 Introduction**

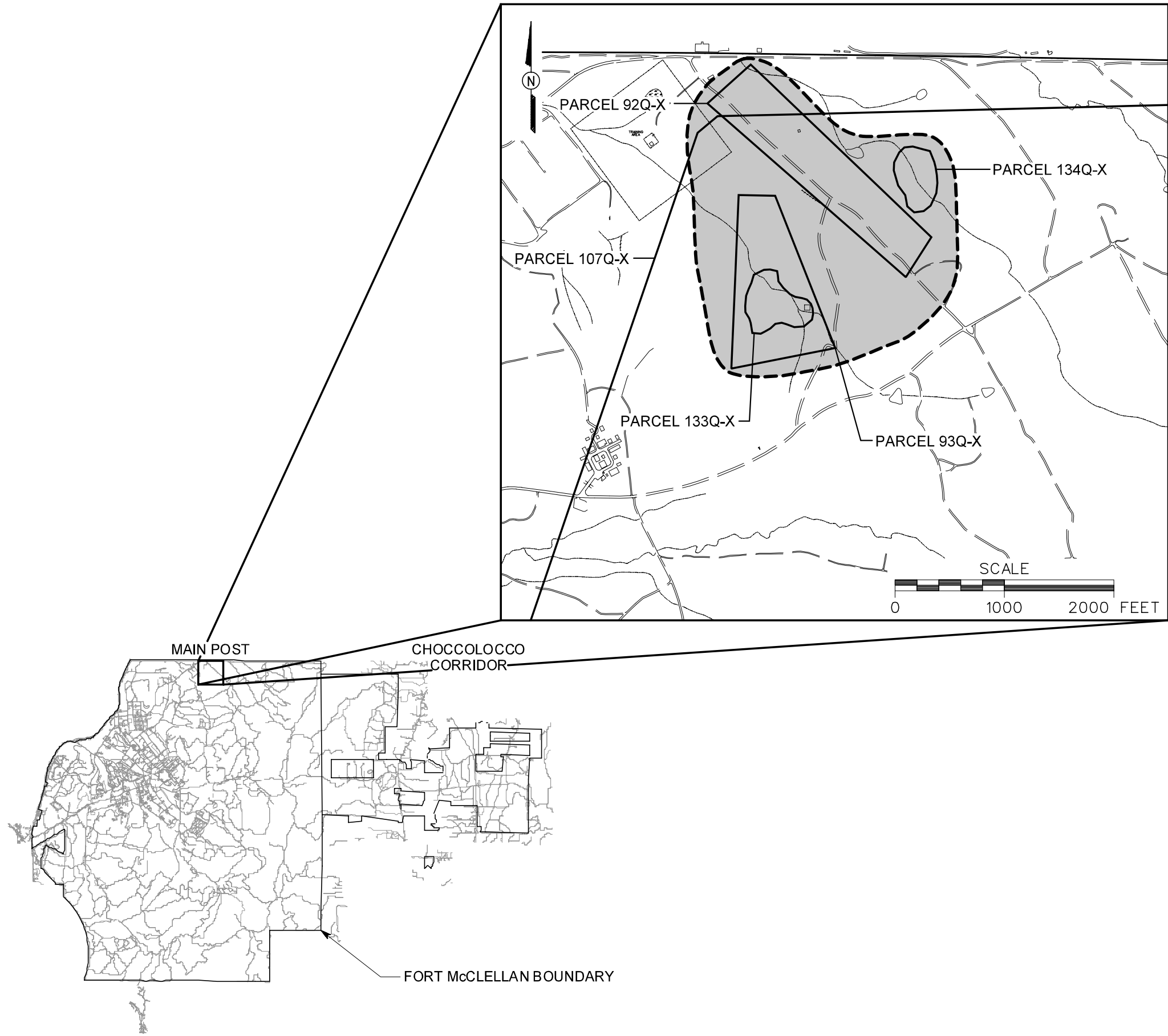
The U.S. Army is conducting studies of the environmental impact of suspected contaminants at Fort McClellan (FTMC) in Calhoun County, Alabama, under the management of the U.S. Army Corps of Engineers (USACE)-Mobile District. The USACE has contracted IT Corporation (IT) to provide environmental services for the site investigation (SI) of Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X, under Task Order CK10, Contract Number DACA21-96-D-0018.

This site-specific field sampling plan (SFSP) attachment to the installation-wide sampling and analysis plan (SAP) (IT, 2000a) for FTMC has been prepared to provide technical guidance for sample collection and for this investigation. This SFSP will be used in conjunction with the site-specific safety and health plan (SSHP) and the site-specific unexploded ordnance (UXO) safety plan developed for this SI, the installation-wide work plan (WP) (IT, 1998), and the SAP. The SAP includes the installation-wide safety and health plan, waste management plan, ordnance and explosives management plan, and quality assurance plan (QAP). Site-specific hazard analyses are included in the SSHP.

### **1.2 Site Description**

Parcels 92Q-X, 93Q-X, 107Q-X, 133Q-X, and 134Q-X are located in the northern area of the Main Post of FTMC (Figure 1-1). The area for this investigation, shown on Figure 1-2, is 123 acres. The area of investigation includes Parcels 92Q-X, 93Q-X, 133Q-X, and 134Q-X in their entirety and the former firing line and suspected impact areas of Parcel 107Q-X. The remaining area within the range fan of Parcel 107Q-X will be addressed in separate investigations.

**Parcel 92Q-X.** Parcel 92Q-X is identified as a former tank range (Figure 1-2). The exact dates of use and types of ordnance fired at the range are unknown (Environmental Science and Engineering, Inc. [ESE], 1998). Parcel 92Q-X is located south of Falcon Road and extends to the southeast toward Mout Road. Syracuse Street spans the length of the parcel inside its western border. The elevation of Parcel 92Q-X ranges from approximately 805 to 960 feet above mean sea level (msl), and the ground surface slopes to the northwest.



LEGEND

UNIMPROVED ROADS AND PARKING

PAVED ROADS AND PARKING

BUILDING

PARCEL BOUNDARY

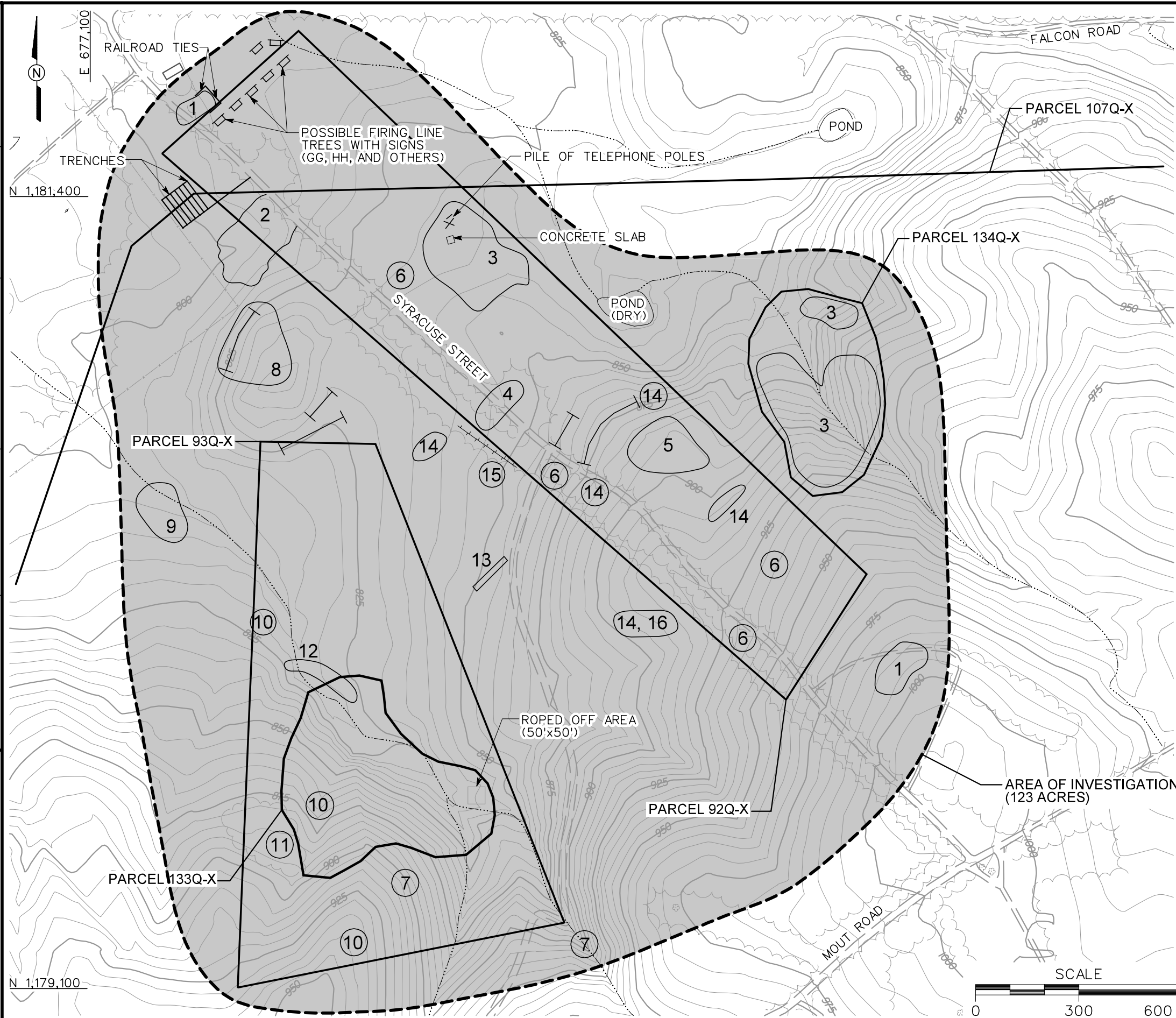
AREA OF INVESTIGATION

SURFACE DRAINAGE / CREEK

FENCE

FIGURE 1-1  
SITE LOCATION MAP  
FORMER TANK RANGES,  
PARCELS 92Q-X AND 93Q-X  
FORMER GRENADE RANGE  
PARCEL 107Q-X, AND  
IMPACT AREAS  
PARCELS 133Q-X AND 134Q-X

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CALHOUN COUNTY, ALABAMA  
Contract No. DACA21-96-D-0018



LEGEND

- UNIMPROVED ROADS AND PARKING
- PAVED ROADS AND PARKING
- BUILDING
- TOPOGRAPHIC CONTOURS (CONTOUR INTERVAL - 5 FOOT)
- TREES / TREELINE
- AREA OF INVESTIGATION
- FIRING LINES
- SURFACE DRAINAGE / CREEK
- FENCE
- BERM
- TRENCH

TRAINING AIDS/PHYSICAL FEATURES OBSERVED

- 1 BARE AREA AND COAL PILE
- 2 AREA OF MOUNDS, TRENCHES, AND DEPRESSIONS
- 3 SHALLOW DEPRESSIONS / TRENCHES
- 4 OLD GATE POSTS AND QUART OF HYDRAULIC FUEL (1994)
- 5 WOOD LINED UNDERGROUND BUNKER AND DEPRESSIONS
- 6 MOUND WITH VERTICAL INDENTATION
- 7 CAR BODIES
- 8 POP-UP TARGET PITS, TRENCHES AND WOOD LINED UNDERGROUND BUNKER/COMMAND POST CONTAINING DEVICES POSSIBLY USED TO OPERATE POP-UP TARGETS
- 9 TWO OLD SIGNS (NOT LEGIBLE) 5, 55-GALLON DRUMS, AND MISCELLANEOUS METAL OBJECTS WITH BULLET HOLES, PARTIALLY RUSTED
- 10 55-GALLON DRUMS
- 11 GROUND SCAR WITH PILE OF 2.36 INCH ROCKET FINS AND PIECES
- 12 6 LARGE MOUNDS, 2 WOODEN TARGET HOLDERS AND A 55-GALLON DRUM
- 13 TRENCH WITH METAL RODS
- 14 PITS WITH WOODEN POSTS AND HINGES
- 15 APPROXIMATELY 10 POSTS AND SILHOUETTE TARGETS
- 16 DISMANTLED BRICK BUILDING AND PIT

FIGURE 1-2  
SITE MAP  
FORMER TANK RANGES,  
PARCELS 92Q-X AND 93Q-X  
FORMER GRENADE RANGE  
PARCEL 107Q-X, AND  
IMPACT AREAS  
PARCELS 133Q-X AND 134Q-X  
  
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CALHOUN COUNTY, ALABAMA  
Contract No. DACA21-96-D-0018



Surface water at the site appears to drain northwest from the range. Local shallow groundwater direction at the site is probably controlled by topography; therefore, groundwater direction in the residuum is likely to the northwest.

Site walks were conducted by IT personnel in October and November 2001. Most of the area of investigation is densely wooded. Features discovered during the site walk included a possible parking, staging, or bivouac area along the former firing line. A coal pile, approximately 6 feet by 6 feet by 3 feet high, bordered with railroad ties, is located in the same area, and scrap metal and telephone poles were located around the site (Feature #1 on Figure 1-2). Near the southern end of the former firing line is a row of trees with small signs, some labeled "GG" and "HH" (as well as others), indicating a possible former firing line. Approximately 600 feet southeast of this area are 4 to 5 telephone poles and a concrete slab (approximately 3 feet by 2 feet) containing small metal pipes (Feature #3). There are also a few shallow depressions and small trenches in the area.

Three depressions were found near the center of the impact area at Parcel 92Q-X. One is approximately 30 feet by 20 feet by 5 feet deep, the second is approximately 10 feet by 10 feet by 4 feet deep, and the third is approximately 20 feet by 15 feet by 4 feet deep. A single piece of partially buried barbed wire was found between two of the depressions. A few shallow depressions and trenches were also located in the area.

Four large mounds, approximately 50 feet long, 20 feet wide, and 5 feet high, are located in the southeastern portion of Parcel 92Q-X (Feature #5). A fifth mound is located near the center of the parcel. Four of the mounds have a vertical indentation on their southern side. The use of these mounds is unknown. The fifth mound contains a wood-lined underground bunker approximately 3 feet by 2 feet at the surface and 10 feet deep. There are metal pipes visible near the entrance. This bunker may have been used to operate suspected pop-up targets in the area. Five small pits are located near the bunker (Feature #14). These pits are approximately 4 feet by 2 feet by 4 feet deep and contain wooden posts and metal hinges, suspected of holding pop-up targets. Approximately 500 feet southwest of this area, just outside the boundary of Parcel 92Q-X, is another area of possible pop-up target pits (Feature #14). There are roughly 15 pop-up target areas. Near the pits are a dismantled brick building and a hole that may have been used as the target operating center (Feature #16).

Immediately southeast of Parcel 92Q-X is a clearing similar to that located near the former firing line (Feature #1). A coal pile is approximately the same size as the one located inside the former firing line. The dimensions are approximately 6 feet by 6 feet by 1 foot high. The use of this area is unknown.

**Parcel 93Q-X.** Parcel 93Q-X is identified as a former tank range (Figure 1-2) and is located just west of Parcel 92Q-X. Parcel 93Q-X ranges in elevation from approximately 810 to 950 feet above msl. An intermittent creek transects the parcel from southeast to northwest. The overall surface drainage is to the northwest and the intermittent creek exits the parcel approximately 300 feet south of the firing line. The exact dates of use of the range and types of ordnance fired are unknown (ESE, 1998).

A large trench approximately 200 feet long by 20 feet wide by 10 feet deep, accompanied by a berm of the same length and 10 feet in height, was noted along the former firing line for Parcel 93Q-X during site walks conducted in October and November 2001. Just to the north of the firing line is another, smaller trench, approximately 80 feet by 3 feet in area and 2 feet in depth.

There is an area of pits and large, round depressions located approximately 200 feet east of the firing line for Parcel 93Q-X (Feature #15). The pits are approximately 10 feet by 5 feet by 2.5 feet deep and contain wooden posts and metal hinges, possibly used for holding pop-up targets. Approximately 100 feet east of this area (bordering the western parcel boundary of Parcel 92Q-X) is a berm, approximately 200 feet by 8 feet, and an area of 8 to 10 posts and human silhouette targets.

Approximately 400 feet southwest of the firing line for Parcel 93Q-X is an area containing two illegible signs and five partially rusted 55-gallon drums that were used as targets (Feature #9). Additional drums used for targets and miscellaneous metallic debris are located to the southeast of this area near the eastern border of Parcel 93Q-X.

A large trench, approximately 150 feet by 10 feet by 10 feet, is located about 400 feet southeast of the former firing line for Parcel 93Q-X (Feature #13). Inside the trench are numerous metal rods approximately 1 inch in diameter and 5 feet in length. The rods may have been used to hold targets.

Near the center of Parcel 93Q-X are six large mounds that were possibly used as targets (Feature #12). These mounds extend into Parcel 133Q-X. One of the mounds contains a wooden target or sign holder. Located downslope of this mound is a second target holder (no mound) and a rusted 55-gallon drum used for target practice. A large concentration of 2.36-inch rocket fins and pieces was seen on the ground surface in the area.

Numerous objects that were used as targets were found near the southern end of Parcel 93Q-X. Near the southeast corner of the parcel boundary are car bodies that were used as small arms targets (Feature #7). Approximately ten 55-gallon drums are located about 700 feet west of the car bodies (Feature #10). The majority of the drums are rusted and contain bullet holes. One drum, labeled "lube oil," does not contain bullet holes and is not as rusted as the others. Approximately 400 feet north of this area are two rusted truck bodies that contain a number of bullet holes. A 2.36-inch rocket fin is located near the truck bodies (Feature #7 on Figure 1-2).

**Parcel 107Q-X.** Parcel 107Q-X is identified as a former grenade range (Figure 1-2) (ESE, 1998). The range fan extends toward the southeast; therefore, direction of fire is suspected to have been to the southeast (ESE, 1998). The range fan encompasses Parcels 93Q-X, 133Q-X, and 134Q-X in their entirety and extends beyond this SI study area. The exact dates of operations and types of ordnance used are unknown (ESE, 1998).

Five parallel trenches, approximately 4 to 5 feet wide, 3 feet deep and 100 feet long, were noted inside the former firing area for Parcel 107Q-X during site walks conducted in October and November 2001. These trenches are oriented northwest to southeast and are bordered on the southeastern side by one perpendicular trench approximately 7 feet wide, 3 feet deep and 500 feet long, which is oriented northeast to southwest.

A large area, approximately 300 feet by 200 feet, containing small mounds, trenches, and other depressions, is located approximately 100 feet southeast of the former firing area for Parcel 107Q-X (Feature #2). Approximately 200 feet south of this area are two trenches; one is approximately 80 feet by 3 feet by 2 feet, and the other is approximately 20 feet by 3 feet by 2 feet (Feature #8). Eight small pits, approximately 4 feet by 2 feet by 4 feet deep, are located uphill, approximately 50 feet south of the trenches. Some of the pits have wooden foundations and contain wooden posts and metal hinges that probably once held pop-up targets. Near the top of the hill is a large underground bunker or command post. The bunker has a wooden foundation and stairs. The dimensions at the surface are 8 feet by 3 feet by 15 feet deep; the interior

extends, beyond view, into the hillside. Inside the bunker are pulleys and devices that were possibly used to control the pop-up targets, which are suspected to have been located downhill.

**Parcels 133Q-X and 134Q-X.** Parcels 133Q-X and 134Q-X (Figure 1-2) are identified as impact areas (ESE, 1998). Parcel 133Q-X is located entirely within the range fan of Parcel 93Q-X. The elevation of Parcel 133Q-X ranges from 830 to 910 feet above msl, and ground surface slopes to the northeast. Parcel 134Q-X is located just to the east of the impact area of Parcel 92Q-X. The overall elevation of Parcel 134 Q-X ranges from 820 to 910 feet above msl, and ground surface slopes to the northwest. An intermittent creek transects the parcel from the southeast to the northeast, with a directional flow towards the northeast.

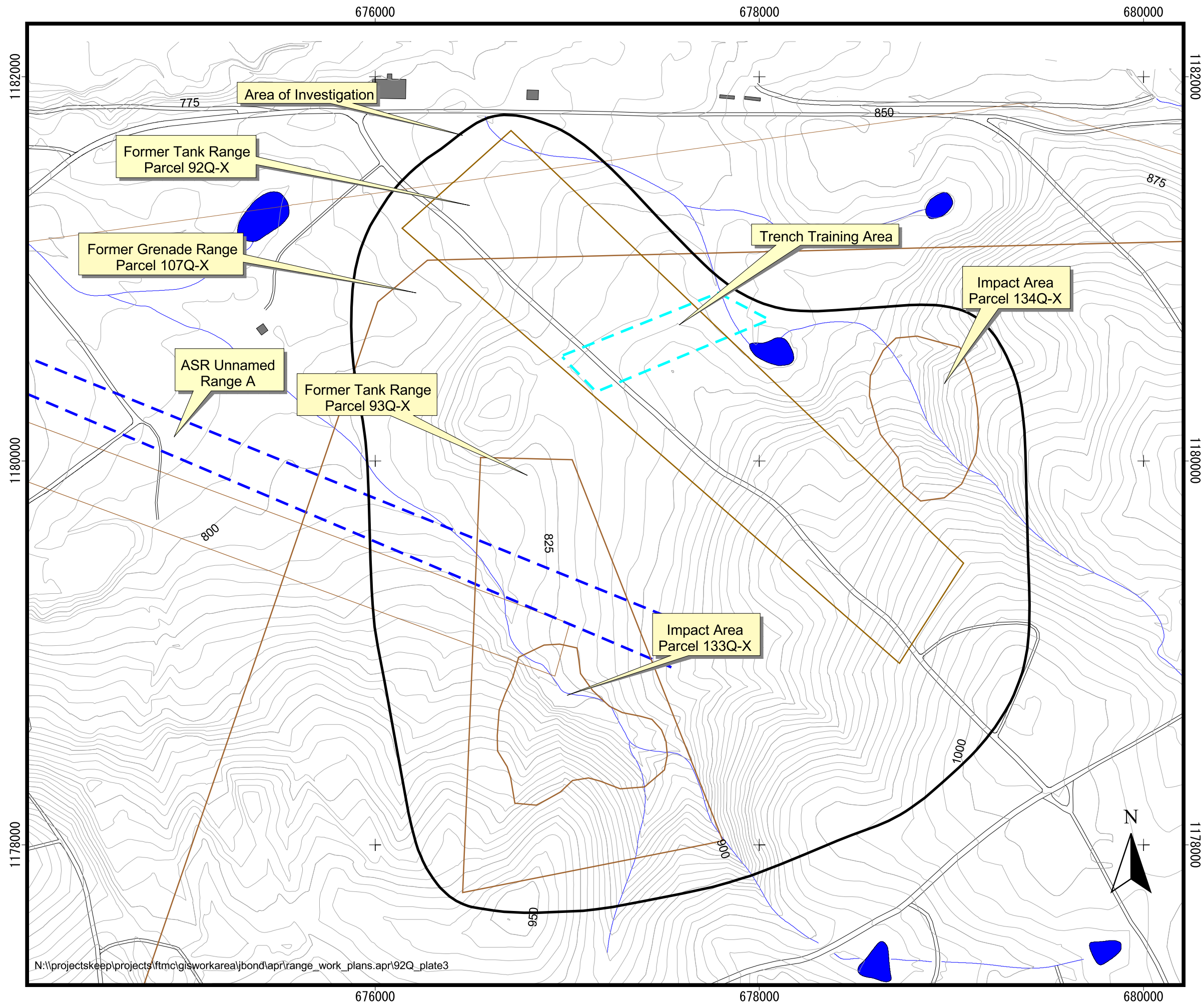
Fourteen 55-gallon drums were noted near the southwest border of Parcel 133Q-X (Feature #10) during site walks conducted in October and November 2001. Some of the drums are labeled “lube oil.” About 150 feet southwest of this area is a ground scar containing a small pile of 2.36-inch rocket fins and pieces (Feature #11 on Figure 1-2) that are believed to be associated with this parcel. These rockets and fins have been marked with a stake for identification and avoidance.

A few shallow depressions were seen throughout Parcel 134Q-X (Feature #3). Although Parcel 134Q-X is identified as an impact area, these depressions appear to resemble defensive position training areas rather than impact craters. Ordnance was not seen on the surface anywhere in the parcel during the site walks.

### **1.2.1 Archive Search Report Ranges**

The *Archives Search Report* (ASR) (USACE, 1999a) shows seven ranges (areas) on Plates 3, 4, 5, and 6 that extend through the area of investigation. These ranges were not described in the FTMC environmental baseline summary (EBS) for Parcels 92Q-X, 93Q-X, 107Q-X, 133Q-X, and 134Q-X. Figures 1-3, 1-4, 1-5, and 1-6, taken from the ASR map plates, show the additional ranges present in the study area from the time period of range use at Fort McClellan. The ASR plates that show additional ranges included in this SI are:

- Plate 3 – World War I Range Use (1917 to 1918)
- Plate 4 – Inter-War Range Use (World War I to World War II)
- Plate 5 – World War II to 1950 Range Use (1941 to 1945)
- Plate 6 – 1950 to 1973 Range Use
- Plate10 – Cumulative Map of All Ranges.

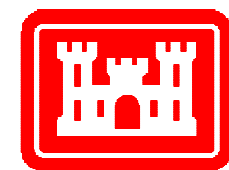


**Figure 1-3**  
**ASR Plate 3 (World War I Use)**  
**Range Location Map**  
**Parcels 92Q-X, 93Q-X, 107Q-X**  
**133Q-X, and 134Q-X**

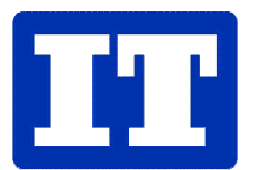
**Legend**

- EBS Range Fan
- Area of Investigation
- Trench Training Area
- ASR Unnamed Range A
- Roads
- Streams
- Topographic Contours 5-foot Interval
- Buildings
- Lake

350 0 350 Feet  
NAD83 State Plane Coordinates



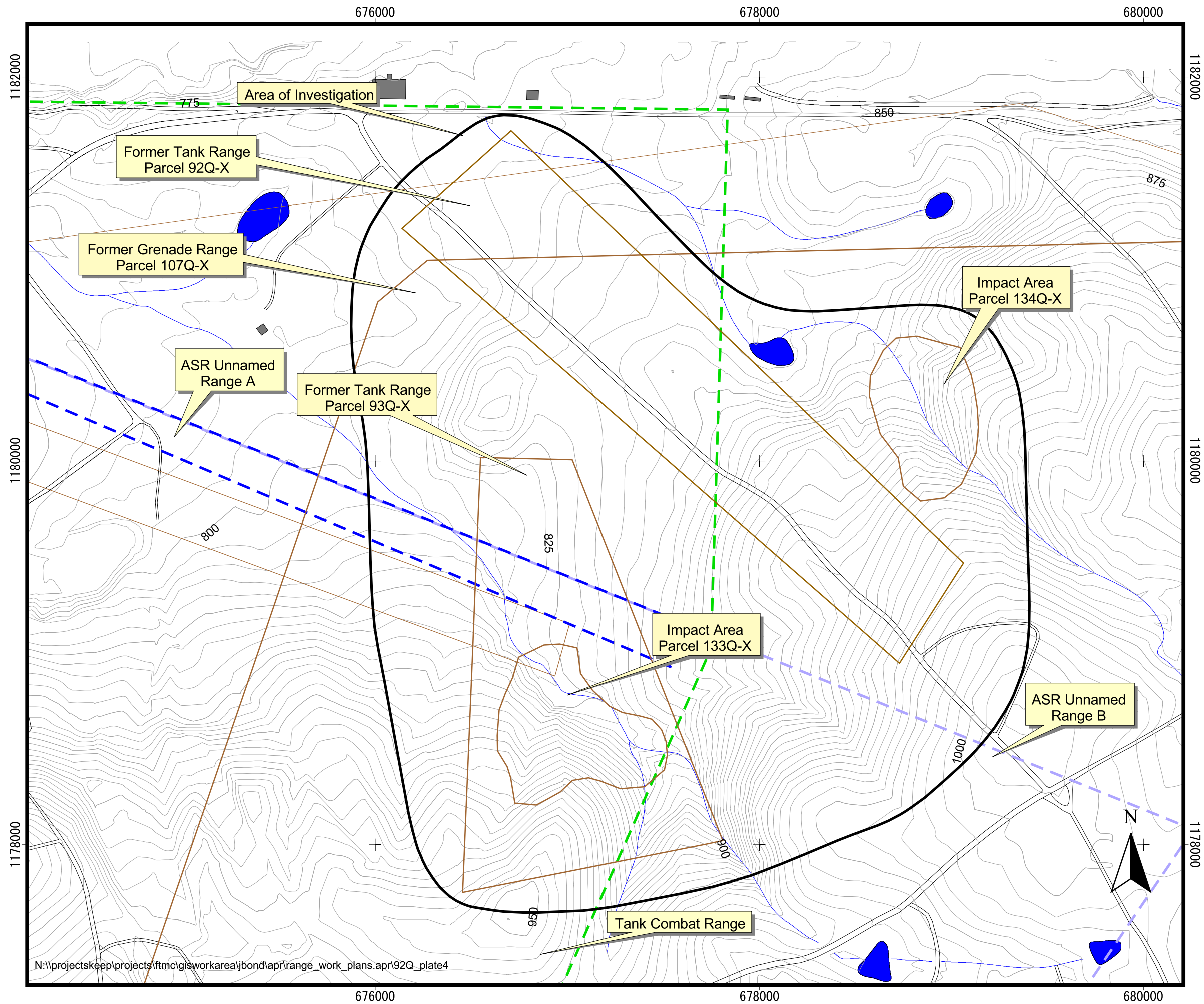
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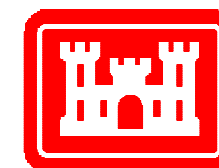
**Figure 1-4**

**ASR Plate 4 (Inter-War Use)  
Range Location Map  
Parcels 92Q-X, 93Q-X, 107Q-X  
133Q-X, and 134Q-X**

**Legend**

- EBS Range Fan
- Area of Investigation
- Tank Combat Range
- ASR Unnamed Range A
- ASR Unnamed Range B
- Roads
- Streams
- Topographic Contours 5-foot Interval
- Buildings
- Lake

350 0 350 Feet  
NAD83 State Plane Coordinates

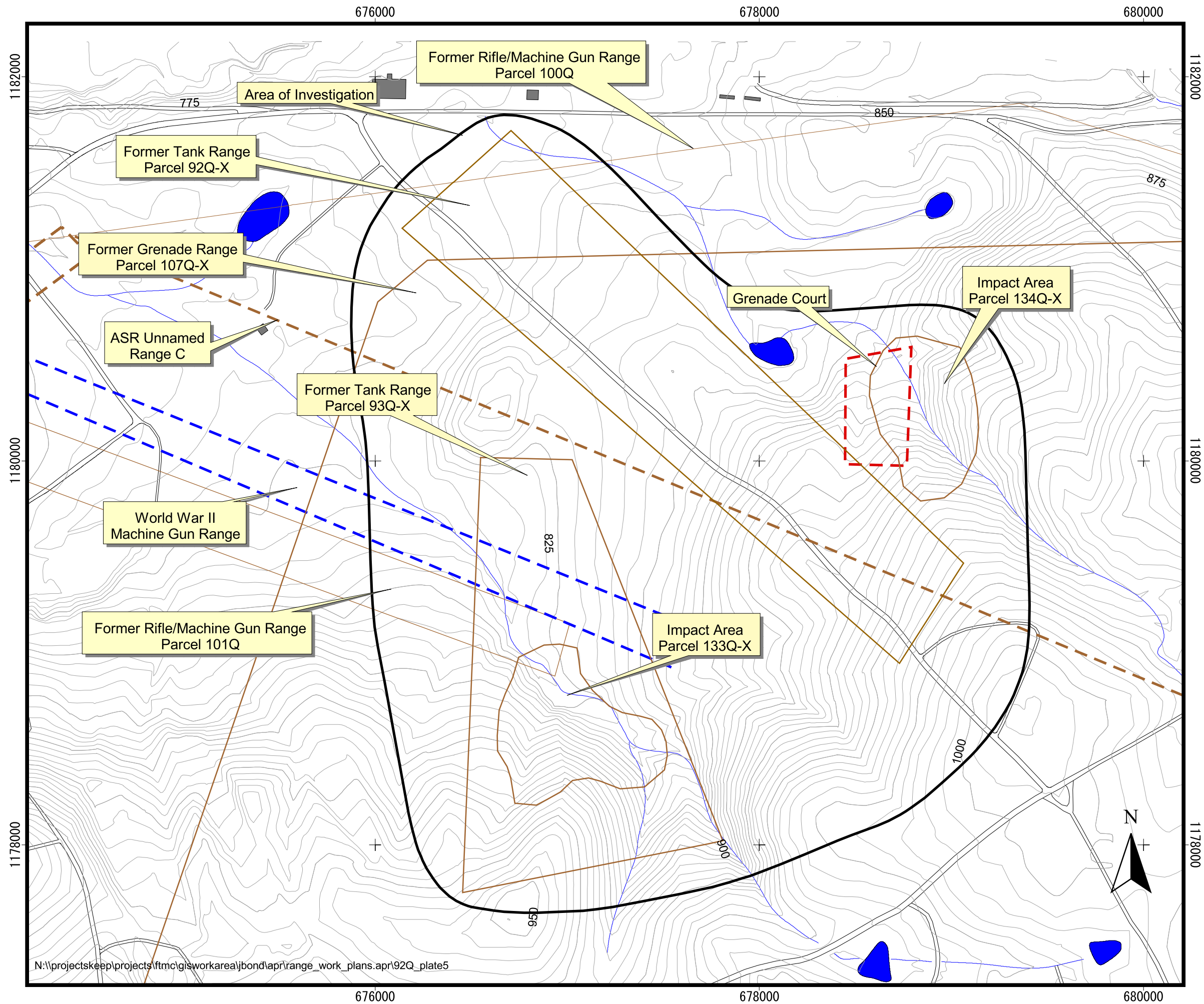


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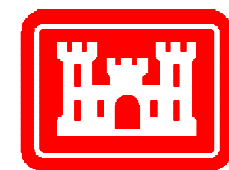


**Figure 1-5**  
**ASR Plate 5 (WWII to 1950)**  
**Range Location Map**  
**Parcels 92Q-X, 93Q-X, 107Q-X**  
**133Q-X, and 134Q-X**

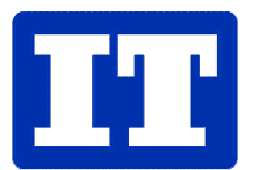
**Legend**

- EBS Range Fan
- Area of Investigation
- Unnamed ASR Range C
- WWII Machine Gun Range
- Grenade Court
- Roads
- Streams
- Topographic Contours 5-foot Interval
- Buildings
- Lake

350 0 350 Feet  
NAD83 State Plane Coordinates



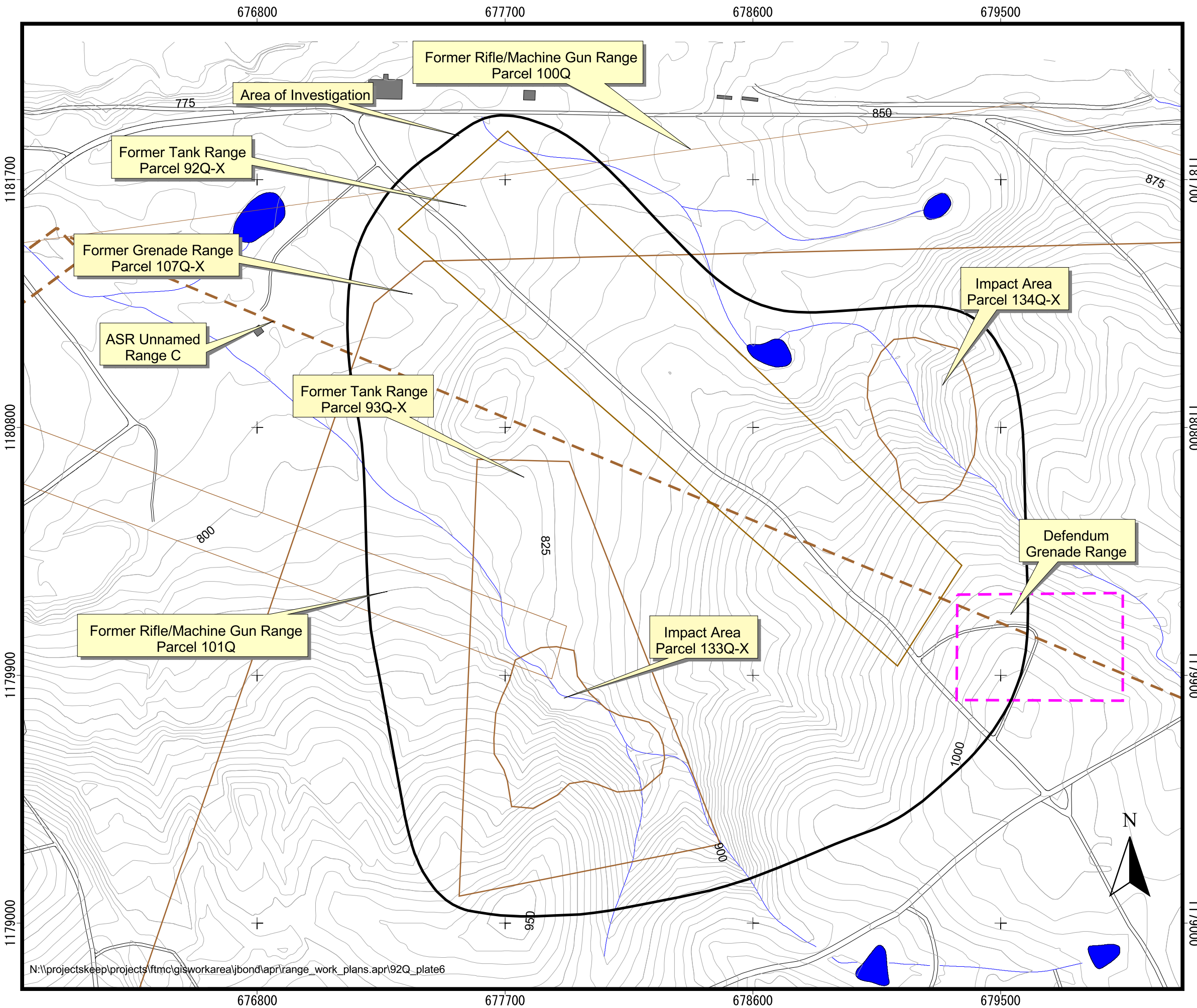
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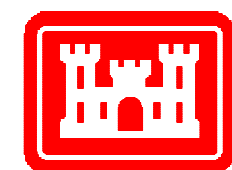
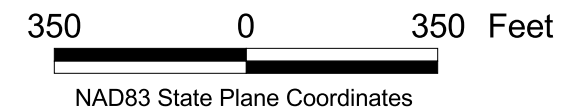
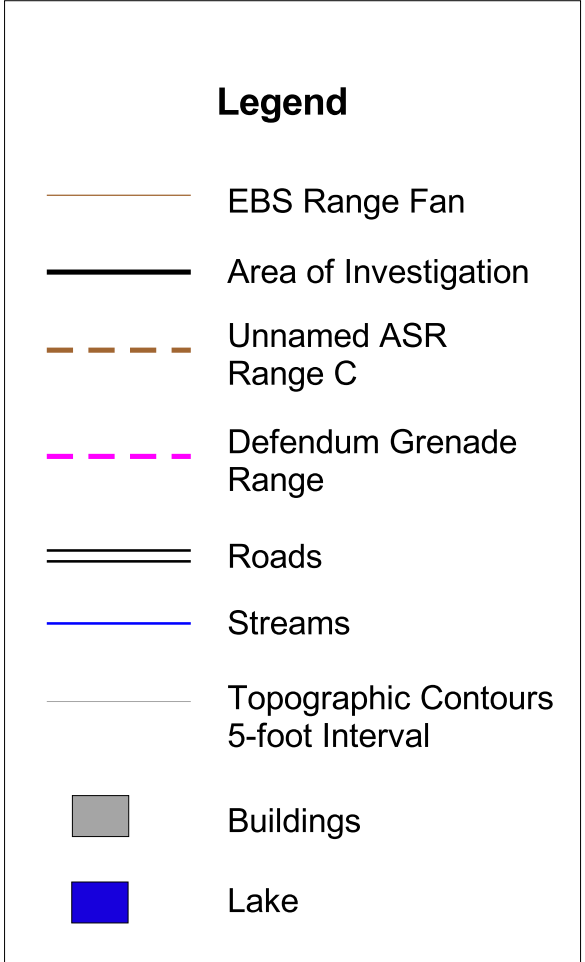
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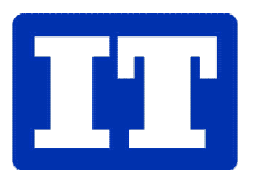




**Figure 1-6**  
**ASR Plate 6 (1950 to 1973)**  
**Range Location Map**  
**Parcels 92Q-X, 93Q-X, 107Q-X**  
**133Q-X, and 134Q-X**



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**Plate 3 of the ASR.** Plate 3 shows two ranges in the area of investigation for this SI. One is labeled “Trench Training Area,” while the other is not named. This unnamed range is labeled “ASR Unnamed Range A” on Figure 1-3. Unnamed Range A overlaps Grenade Range 107Q-X and Impact Area Parcel 133Q-X and runs parallel to EBS Parcel 101Q, Former Rifle, Machine Gun Range. The Trench Training Area intersects Former Tank Range, Parcel 92Q-X. The orientation of Unnamed Range A and the location of the firing line presented in the EBS for Parcel 101Q suggest that the direction of fire was to the southeast. The likely impact area for Unnamed Range A is the hillside located east of Former Tank Range, Parcel 93Q-X.

**Plate 4 of the ASR.** Plate 4 (Figure 1-4) shows two ranges in the area of investigation for this SI. One of the ranges is labeled as a Tank Combat Range and intersects the other ASR range, an unnamed rifle and pistol range, Unnamed Range B. The Tank Combat Range and an Unnamed Range B encompass a significant portion of the north-central portion of the Main Post, including a significant portion of area of investigation for this SI. According to the ASR, the Tank Combat Range appears on several maps during the Inter-War period. The exact nature of training activities at the Tank Combat Range and Unnamed Range B and the range boundaries of each are unknown. Firing points, direction of fire, and impact areas could not be determined from the shape or orientation of these ranges.

**Plate 5 of the ASR.** Plate 5 (Figure 1-5) shows three ranges in the area of investigation for this SI. One of the ranges includes Unnamed Range A which has now been named World War II Machine Gun Range on Plate 5. The second range includes a Grenade Court that appears only on the electronic file version of the ASR plates and not on the hard-copy (paper) versions of the ASR. The Grenade Court is located east of the area of investigation and transects Parcel 92Q-X only at the extreme southwestern corner. The Grenade Court is not well documented in the ASR but is mentioned once during the discussion of ordnance and explosives at Fort McClellan during World War II: “A rocket range (bazooka), a hand grenade court and two rifle grenade courts were built on Combat Range #2. A second grenade court was located east of Reilly Airfield” (USACE, 1999a). The safety fan of the third range, Unnamed Range C, intersects Parcel 92Q-X and 107Q-X, while encompassing Parcel 93Q-X and 132Q-X.

**Plate 6 of the ASR.** Plate 6 (Figure 1-6) shows one range in the area of investigation for this SI. The 1967 Defendum Grenade Range, a three-acre range, appears on the 1967 range map but

was abandoned by 1974 (USACE, 1999a). This range slightly intersects the area of investigation for this SI. No additional information is provided in the ASR for this range.

### **1.2.2 Aerial Photographs**

Available aerial photographs were reviewed to define historical activity in the study area. The following is a summary of the review of aerial photographs for this study area.

**1937.** The 1937 aerial photograph shows most of the study area as fully wooded. Although the quality of the photograph is not very good, there does not appear to be any activity in the area at this time. This photograph is not presented in this document.

**1940.** The 1940 photograph (Figure 1-7) shows a long, bare strip of land that extends to a length coinciding with the shape of Parcel 92Q-X. The ASR does not indicate range activity in this area until 1949, which is when this bare area was first documented as Tank Range #1 (USACE, 1999a). The use of the area in 1940 is not recorded and not known. There does not appear to be any activity in the vicinity of Parcels 93Q-X, 107Q-X, 133Q-X, and 134Q-X in the 1940 photograph.

**1944.** The 1944 aerial photograph (Figure 1-8) indicates clearing in areas surrounding Parcel 92Q-X. There is an area of cleared land that corresponds to the range shape of Parcel 93Q-X. A cleared area also appears just east of Parcel 92Q-X. This area nearly corresponds to the outline of the impact area, Parcel 134Q-X. Activity is still evident in Parcel 92Q-X.

**1954.** The 1954 aerial photograph appears very similar to the 1944 photograph; however, there is evidence of increased activity immediately west of Parcel 93Q-X and outside of this study area. Activity in Parcels 92Q-X, 93Q-X, 133Q-X, and 134Q-X has not changed since 1944.

**1961.** The 1961 photograph (Figure 1-9) reveals a moderate increase in tree and shrub growth in the Parcel 134Q-X area. A cleared area appears between Parcel 92Q-X and the former firing line for Parcel 93Q-X. A feature resembling a northwest-southeast berm or trench is evident in the cleared area. The use of this surface feature is unknown.

**1964.** This area corresponds to the location of the trenches seen during site walks and, in these aerial photographs, there are surface features resembling trenches. There is a small clearing at the southeastern boundary of Parcel 92Q-X. The use of this area is unknown, but it may

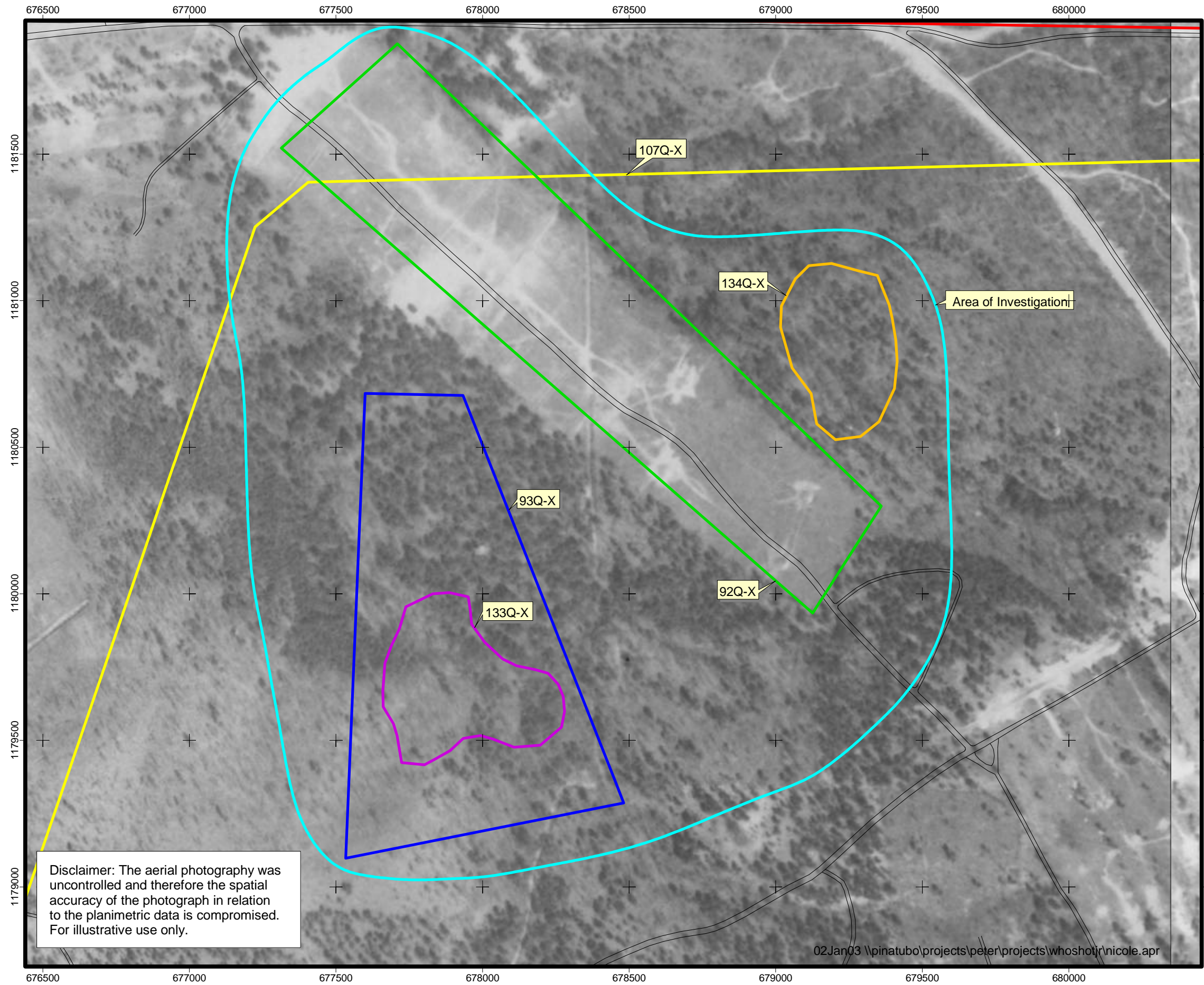
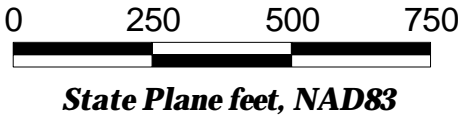
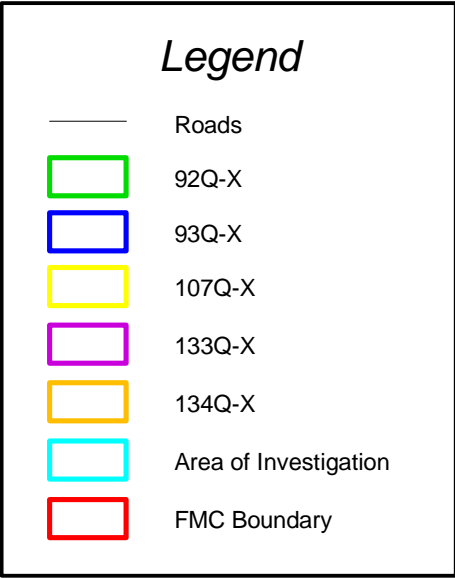


Figure 1-7

1940 Aerial Photograph -  
Inter-War Range Use



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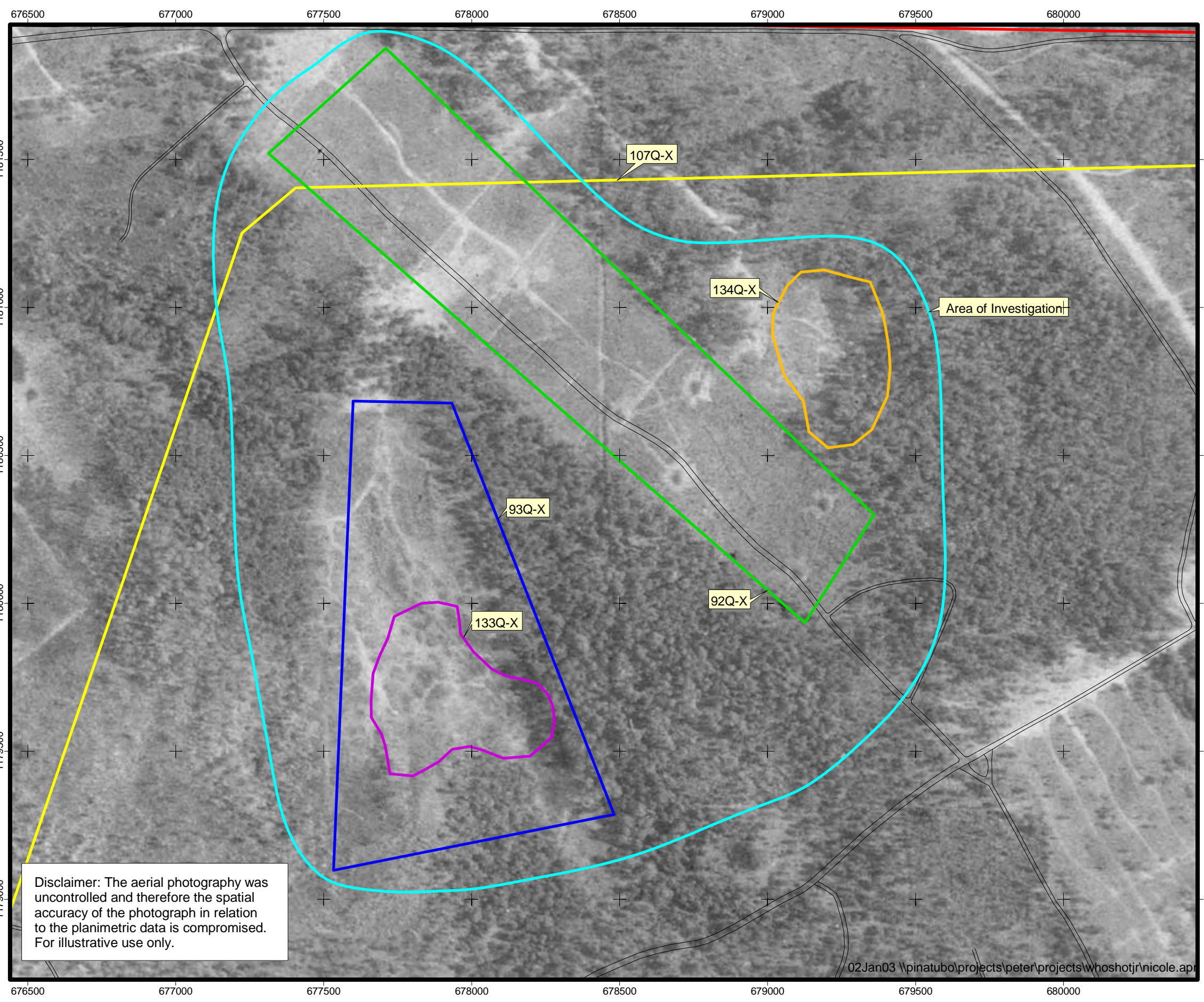
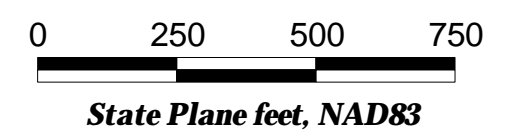


Figure 1-8

# 1944 Aerial Photograph - WWII Range Use

*Legend*

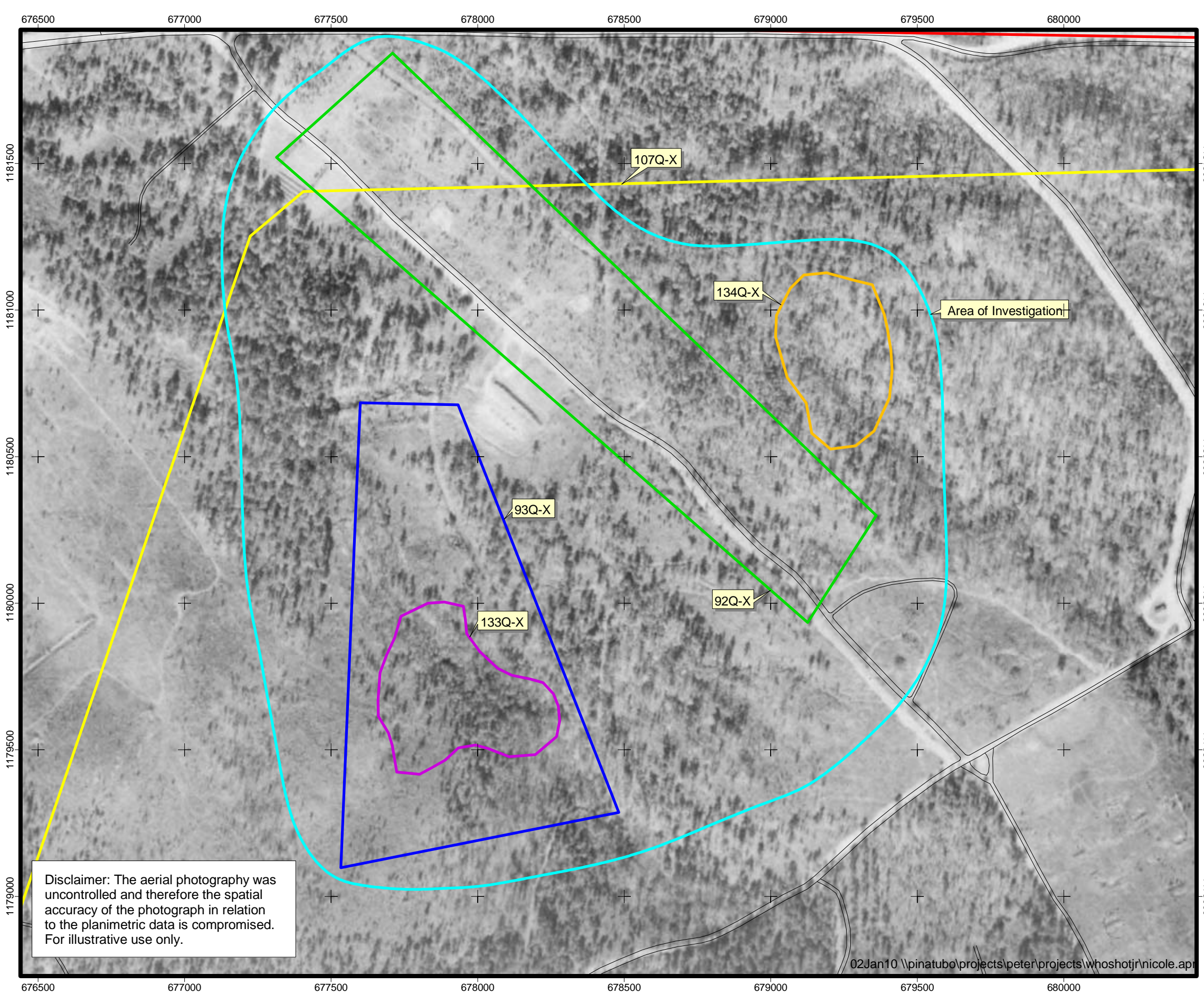
	Roads
	92Q-X
	93Q-X
	107Q-X
	133Q-X
	134Q-X
	Area of Investigation
	FMC Boundary



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Fort McClellan  
Calhoun County, Alabama  
Contract No. DACA21-96-D-0018







**Figure 1-9**

**1961 Aerial Photograph**


*Legend*

- Roads
- 92Q-X
- 93Q-X
- 107Q-X
- 133Q-X
- 134Q-X
- Area of Investigation
- FMC Boundary



Disclaimer: The aerial photography was uncontrolled and therefore the spatial accuracy of the photograph in relation to the planimetric data is compromised. For illustrative use only.

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Contract No. DACA21-96-D-0018



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correspond to a hand grenade range shown on Plate 5 of the ARS. Clearings are still visible in Parcels 92Q-X, 93Q-X, and 133Q-X.

**1969.** The 1969 aerial photograph (Figure 1-10) appears very similar to the 1961 and 1964 photographs. Increased activity to the west of the study area has resulted in a ground scar in Parcels 93Q-X and 133Q-X (possibly from the adjacent range to the west). This ground scar was seen during site walks conducted by IT during late 2001. There is a slight increase in vegetation throughout the remainder of the study area.

**1973.** The 1973 aerial photograph (Figure 1-11) shows a slight difference in activity since the 1969 photograph was taken. The non-vegetated area between Parcels 92Q-X and 93Q-X contains six square clearings in a row. Activity in Parcel 92Q-X is mainly west of the road (Syracuse Street), while the area east of the road is mostly wooded.

**1976.** The 1976 aerial photograph shows increased vegetation and tree cover in the study area since the 1973 photograph. The cleared area between Parcels 92Q-X and 93Q-X is less visible, and the six square clearings seen in the 1973 photograph are only slightly visible.

**1998.** The 1998 aerial photo (Figure 1-12) reveals that the study area has been largely reclaimed by vegetation. A few cleared areas remain visible. The six square clearings previously noted in the non-vegetated area between Parcels 92Q-X and 93Q-X are no longer visible. These six square clearings were not observed during site walks conducted by IT in late 2001.

### **1.2.3 Soil Descriptions**

**Soil Types.** Soils in this study area consist of the following seven soil units (U.S. Department of Agriculture [USDA], 1961):

- Anniston gravelly clay loam, 10 to 15 percent slopes, severely eroded (AbD3) – Central portion of the SI study area, including portions of Parcels 92Q-X, 93Q-X, 107Q-X, 133Q-X, and 134Q-X
- Anniston and Allen gravelly loams, 2 to 6 percent slopes, eroded (AcB2) – Small portion of the SI study area, just southeast of Parcel 92Q-X



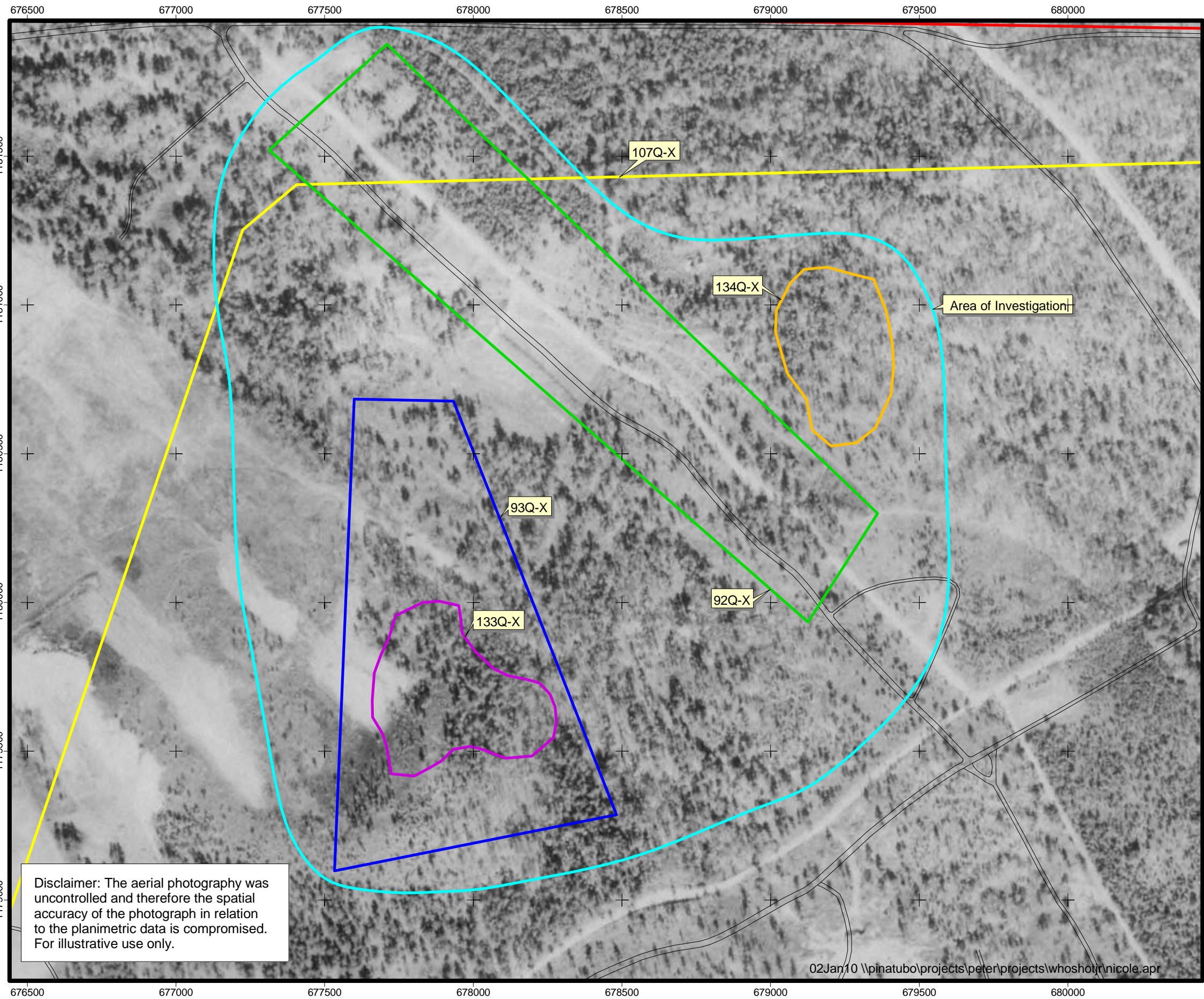


Figure 1-10

1969 Aerial Photograph

*Legend*

	Roads
	92Q-X
	93Q-X
	107Q-X
	133Q-X
	134Q-X
	Area of Investigation
	FMC Boundary



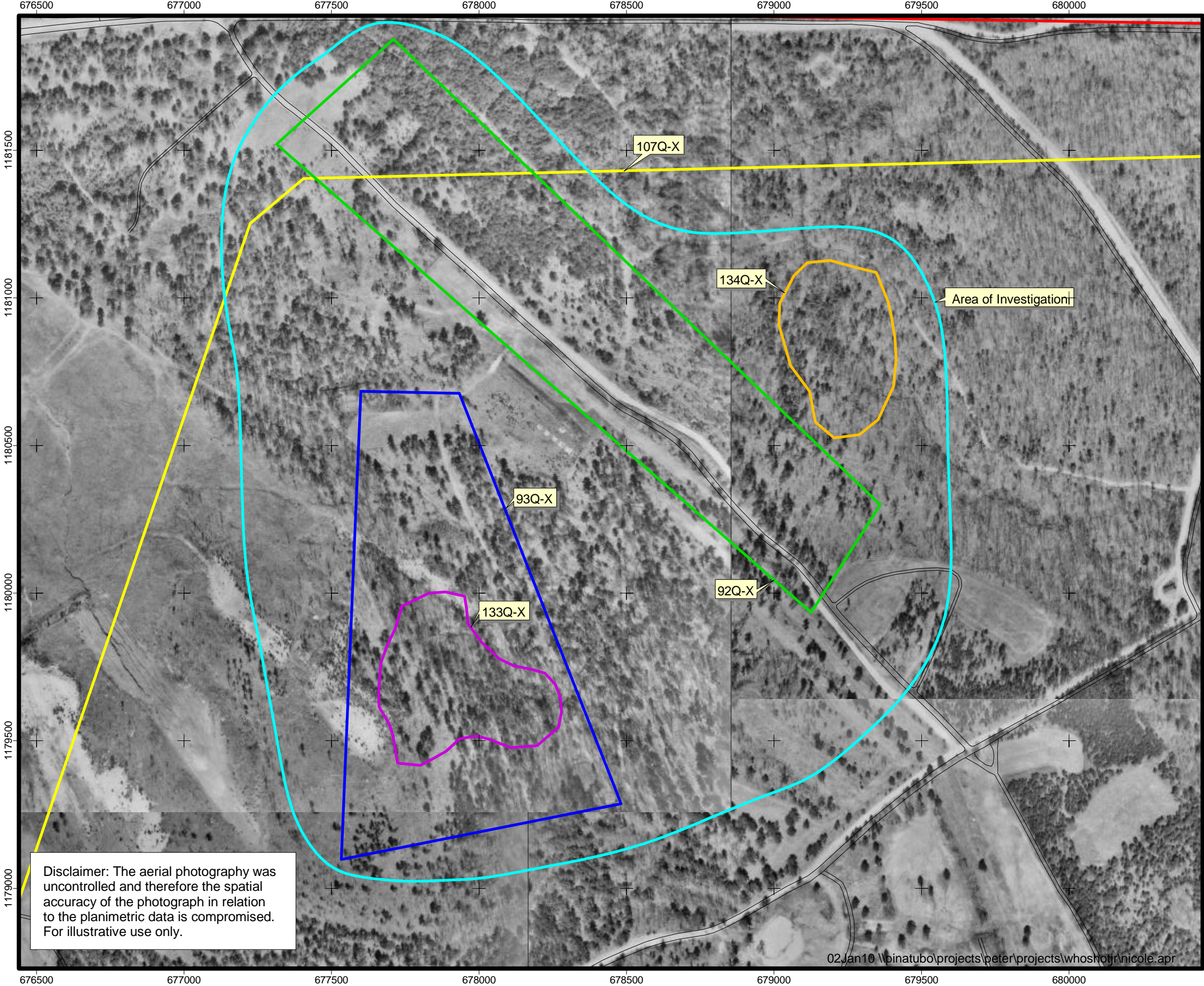
U.S. Army Corps of Engineers  
Mobile District  
Fort McClellan  
Calhoun County, Alabama  
Contract No. DACA21-96-D-0018



Disclaimer: The aerial photography was uncontrolled and therefore the spatial accuracy of the photograph in relation to the planimetric data is compromised. For illustrative use only.

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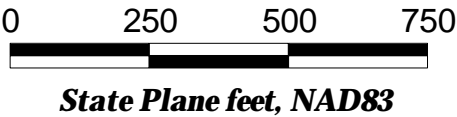
Disclaimer: The aerial photography was uncontrolled and therefore the spatial accuracy of the photograph in relation to the planimetric data is compromised. For illustrative use only.

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**Figure 1-11**  
**1973 Aerial Photograph**

*Legend*

	Roads
	92Q-X
	93Q-X
	107Q-X
	133Q-X
	134Q-X
	Area of Investigation
	FMC Boundary



**U. S. Army Corps  
of Engineers**  
Mobile District



U.S. Army Corps of Engineers  
Mobile District  
Fort McClellan  
Calhoun County, Alabama  
Contract No. DACA21-96-D-0018





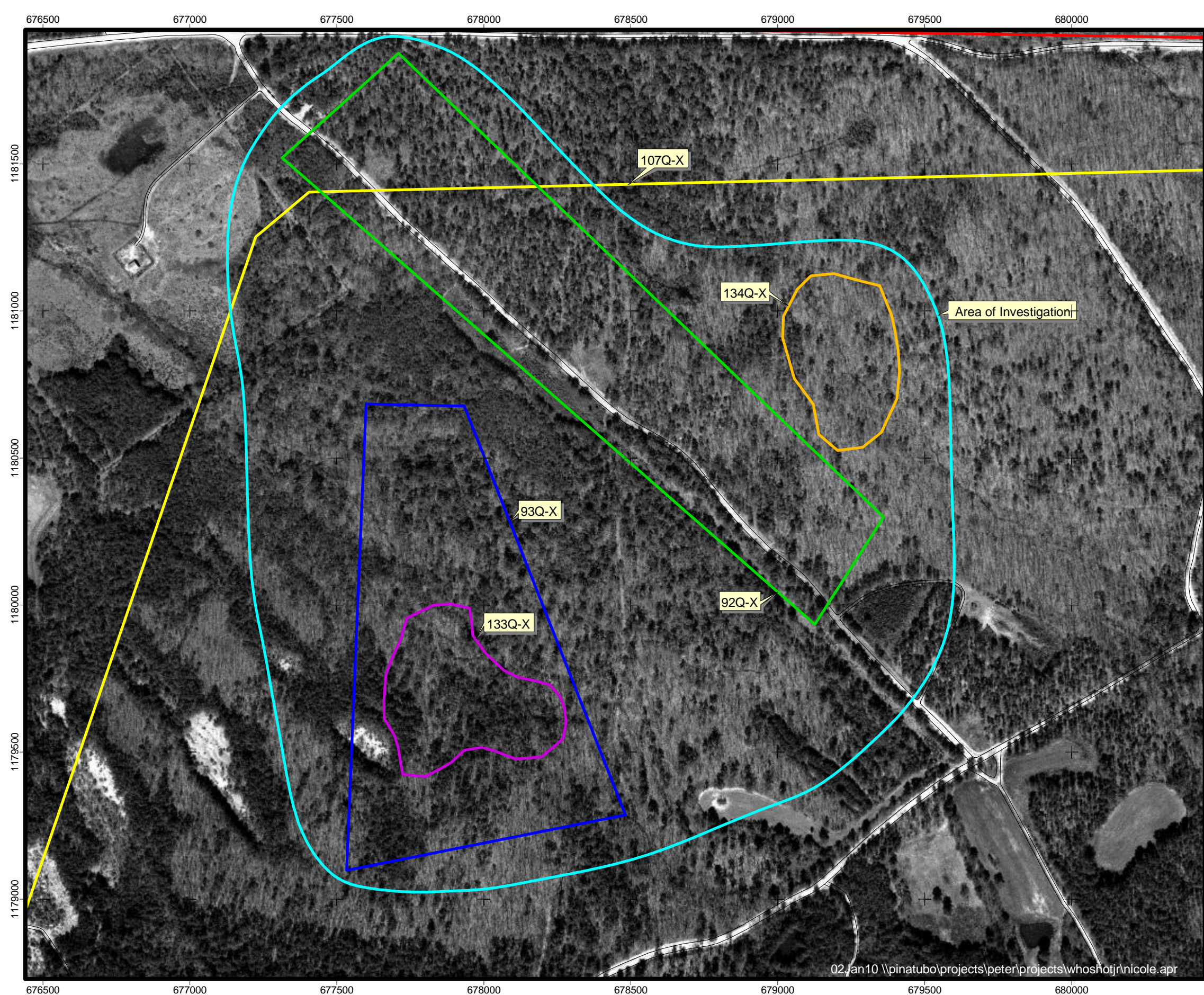
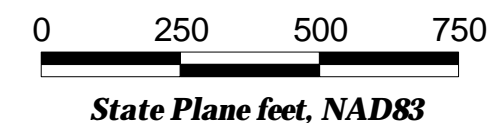


Figure 1-12

## 1998 Aerial Photograph



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Contract No. DACA21-96-D-0018





- Anniston and Allen gravelly loams, 6 to 10 percent slopes, eroded (AcC2) – Southern and western portions of the study area
- Anniston and Allen gravelly loams, 10 to 15 percent slopes, eroded (AcD2) – Eastern and southeastern portions of the study area, including a small portion of Parcel 92Q-X
- Anniston and Allen stony loams, 10 to 25 percent slopes, (AdE) – South-central and northeast portions of the study area, including portions of Parcels 93Q-X, 107Q-X, 133Q-X, and 134Q-X
- Cumberland gravelly loam, 2 to 6 percent slopes, eroded (CoB2) – Northern portion of the study area, including northern half of Parcel 92Q-X and portions of Parcels 93Q-X and 107Q-X
- Philo and Stendal soils, local alluvium, 0 to 2 percent slopes (PkA) – Along gully in northeastern portion of the study area, intersecting Parcel 134Q-X.

### **1.3 Scope of Work**

The scope of work for activities associated with the SI at Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X, as specified by the statement of work (USACE, 1999b), includes the following tasks:

- Develop the SFSP attachment.
- Develop the SSHP attachment.
- Conduct a surface and near-surface UXO survey over all areas to be included in the sampling effort.
- Provide downhole UXO support for all intrusive drilling to determine buried downhole hazards.
- Collect 36 surface soil samples, 36 subsurface soil samples, 10 groundwater samples, 7 surface water samples, 8 sediment samples, and 1 seep sample to determine whether potential site-specific chemicals (PSSC) are present at Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X, and to provide data useful for supporting any future planned corrective measures and closure activities.
- Analyze samples for the parameters listed in Section 4.5.

UXO surface sweeps and downhole surveys of soil borings will be required to support field activities at this site. The surface sweeps and downhole surveys will be conducted to identify anomalies for the purposes of UXO avoidance. The site-specific UXO safety plan will be used to support sample collection activities at Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X.

At completion of the field activities and sample analyses, draft and final SI reports will be prepared to summarize the results of the activities, to evaluate the absence or presence of PSSCs at this site, and to recommend further actions, if appropriate. The SI report will be prepared in accordance with current guidelines of the U.S. Environmental Protection Agency (EPA), Region IV, and the Alabama Department of Environmental Management (ADEM).

## **2.0 Summary of Existing Environmental Studies**

---

An EBS was conducted by ESE to document current environmental conditions of all FTMC property (ESE, 1998). The study was to identify sites that, based on available information, have no history of contamination and comply with U.S. Department of Defense guidance for fast-track cleanup at closing installations. The EBS also provides a baseline picture of FTMC properties by identifying and categorizing the properties by the following seven criteria:

1. Areas where no storage, release, or disposal of hazardous substances or petroleum products has occurred (including no migration of these substances from adjacent areas)
2. Areas where only release or disposal of petroleum products has occurred
3. Areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial response
4. Areas where release, disposal, and/or migration of hazardous substances has occurred, and all removal or remedial actions to protect human health and the environment have been taken
5. Areas where release, disposal, and/or migration of hazardous substances has occurred, and removal or remedial actions are underway, but all required remedial actions have not yet been taken
6. Areas where release, disposal, and/or migration of hazardous substances has occurred, but required actions have not yet been implemented
7. Areas that are not evaluated or require further evaluation.

For non-Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) environmental or safety issues, the parcel label includes the following components: a unique non-CERCLA issue number, the letter "Q" designating the parcel as a Community Environmental Response Facilitation Act (CERFA) Category 1 Qualified Parcel, and the code for the specific non-CERCLA issue(s) present (ESE, 1998). The non-CERCLA issue codes used are:

- A = Asbestos (in buildings)
- L = Lead-based paint (in buildings)
- P = Polychlorinated biphenyls
- R = Radon (in buildings)
- RD = Radionuclides/radiological issues

- X = UXO
- CWM = Chemical warfare material.

The EBS was conducted in accordance with the CERFA protocols (CERFA-Public Law 102-426) and U.S. Department of Defense policy regarding contamination assessment. Record searches and reviews were performed on all reasonably available documents from FTMC, ADEM, EPA Region IV, and Calhoun County, as well as a database search of CERCLA-regulated substances, petroleum products, and Resource Conservation and Recovery Act-regulated facilities. Available historical maps and aerial photographs were reviewed to document historical land uses. Personal and telephone interviews of past and present FTMC employees and military personnel were conducted. In addition, visual site inspections were conducted to verify conditions of specific property parcels.

Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X, were issued the letter "Q," designating the parcels as Category 1 CERFA sites. Category 1 sites are areas where no known or recorded storage, release, or disposal (including migration) has occurred on site property. The ranges were also assigned the UXO qualifier ("X") because of the lack of information regarding the type of ordnance fired at these locations.

## **3.0 Site-Specific Data Quality Objectives**

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### **3.1 Overview**

The data quality objective (DQO) process is followed to establish data requirements. This process ensures that the proper quantity and quality of data are generated to support the decision-making process associated with the action selection for Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X. This section incorporates the components of the DQO process described in the publication EPA 540-R-93-071 *Data Quality Objectives Process for Superfund* (EPA, 1993). The DQO process as applied to Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X, is described in more detail in Section 4.3 of the WP (IT, 1998). Table 3-1 provides a summary of the factors used to determine the appropriate quantity of samples and the procedures necessary to meet the objectives of the SI and establish a basis for future action at this site.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Chapter 4.0 in this SFSP and Table 6-1 in the QAP. Data will be reported in accordance with definitive data requirements of Chapter 2, *Chemistry Data Reporting Requirements and Data Package Deliverables*, USACE Engineering Manual 200-1-6, *Chemical Quality Assurance for Hazardous, Toxic and Radioactive Waste (HTRW) Projects* (USACE, 1997) and evaluated by the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP). Chemical data will be reported by the laboratory via hard-copy data packages using Contract Laboratory Program-like forms, along with electronic copies. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria.

### **3.2 Data Users and Available Data**

The available data, presented in Table 3-1, related to the SI at Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X, have been used to formulate a site-specific conceptual model. This conceptual model was developed to support the development of this SFSP, which is necessary to meet the objectives of these activities and to establish a basis for future action at the site. The users of the data and information generated during field activities are primarily EPA, USACE, ADEM, FTMC, and the USACE supporting contractors. This SFSP, along with the necessary companion documents, has been designed to provide the regulatory agencies with sufficient detail to reach a determination as to the adequacy of the scope of work. The program has also been designed to

Table 3-1

**Summary of Data Quality Objectives**  
**Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X and Impact Areas, Parcels 133Q-X and 134Q-X**  
**Site Investigation**  
**Fort McClellan, Calhoun County, Alabama**

Users	Available Data	Conceptual Site Model	Media of Concern	Data Uses and Objectives	Data Types	Analytical Level	Data Quantity
EPA, ADEM, USACE, DOD, FTMC, IT Corporation, other contractors, and possible future land users	None	<u>Contaminant Source</u> Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X (explosives and metals)	<u>Surface soil</u>	SI to confirm the presence or absence of contamination in the site media	<u>Surface soil</u> TAL Metals, Nitroaromatic and Nitramine Explosives; Plus 10% of Samples for TCL VOCs, TCL SVOCs, CL Pesticides, OP Pesticides, and CL Herbicides	Definitive data in data packages (as defined in USACE EM200-1-6)	36 direct-push surface soil samples + QC
			<u>Subsurface Soil</u>				
			<u>Groundwater</u>	Definitive quality data for future decision-making	<u>Subsurface Soil</u> TAL Metals, Nitroaromatic and Nitramine Explosives; Plus 10% of Samples for TCL VOCs, TCL SVOCs, CL Pesticides, OP Pesticides, and CL Herbicides	Definitive data in data packages (as defined in USACE EM200-1-6)	36 direct-push subsurface soil samples + QC
		<u>Migration Pathways</u> Infiltration to subsurface soil, infiltration and leaching to groundwater, biotransfer to venison, dust emissions and volatilization to ambient air, groundwater discharge to surface water, and runoff and erosion to surface water and sediment	<u>Surface Water</u>				
			<u>Seep</u>		<u>Groundwater</u> TAL Metals, Nitroaromatic and Nitramine Explosives; Plus 10% of Samples for TCL VOCs, TCL SVOCs, CL Pesticides, OP Pesticides, and CL Herbicides	Definitive data in data packages (as defined in USACE EM200-1-6)	10 groundwater samples + QC
			<u>Sediment</u>		<u>Seep and Surface Water</u> TAL Metals, Nitroaromatic and Nitramine Explosives; Plus 10% of Samples for TCL VOCs, TCL SVOCs, CL Pesticides, OP Pesticides, and CL Herbicides	Definitive data in data packages (as defined in USACE EM200-1-6)	7 surface water samples and 1 seep sample + QC
		<u>Potential Receptors</u> Residents (future), Recreational site user (current and future)			<u>Sediment</u> TAL Metals, Nitroaromatic and Nitramine Explosives; Plus 10% of Samples for TCL VOCs, TCL SVOCs, CL Pesticides, OP Pesticides, and CL Herbicides	Definitive data in data packages (as defined in USACE EM200-1-6)	8 sediment samples + QC
		<u>PSSC</u> metals, nitroexplosives, VOCs, SVOCs, herbicides, and pesticides					

ADEM - Alabama Department of Environmental Management.

CESAS - Corps of Engineers South Atlantic Savannah.

CL - Chlorinated.

DOD - U.S. Department of Defense.

EM200-1-6 - USACE Engineering Manual, *Chemical Quality Assurance for HTRW Projects*, October 10, 1997.

EPA - U.S. Environmental Protection Agency.

FTMC - Fort McClellan.

OP - Orthophosphorus.

PSSC - Potential site-specific chemical.

QC - Quality control.

SI - Site investigation.

SVOC - Semi-volatile Organic Compounds.

TAL - Target analyte list.

TCL - Target compound list.

TOC - Total organic carbon.

USACE - U.S. Army Corps of Engineers.

VOC - Volatile Organic Compounds.

provide the level of defensible data and information required to confirm or rule out the existence of residual chemical contamination in site media.

### **3.3 Conceptual Site Exposure Model**

The conceptual site exposure model (CSEM) provides the basis for identifying and evaluating potential risks and hazards to human health in the risk assessment. The CSEM includes receptors and potential exposure pathways appropriate to all plausible scenarios. The CSEM facilitates a consistent and comprehensive evaluation of risk to human health through graphically presenting all possible exposure pathways, including sources, release and transport pathways, and exposure routes. In addition, the CSEM helps to ensure that potential pathways are not overlooked. The elements of a complete exposure pathway and CSEM are:

- Source (i.e., contaminated environmental) media
- Contaminant release mechanisms
- Contaminant transport pathways
- Receptors
- Exposure pathways.

Contaminant release mechanisms and transport pathways are not relevant for scenarios involving direct receptor contact with a contaminated source medium.

Primary contaminant releases were probably limited to training activities, more precisely, pieces of ammunition deposited on or within surface and subsurface soil and their subsequent breakdown. Potential contaminant transport pathways include infiltration and leaching to subsurface soil and groundwater, biotransfer to deer through browsing, dust emissions and volatilization to ambient air, groundwater discharge to surface water, surface water runoff, and erosion to surface water and sediment.

Currently the ranges are not utilized and are not maintained. Trees cover most of the study area. The access roads leading to the ranges are secured with locked gates; however, the ranges are not fenced. Therefore, people may trespass at the sites for hunting. There is not sufficient surface water to support fish habitat for fish consumption. The only plausible receptor under the current land-use scenario is a recreational site user who may hunt. Other potential receptors considered, but not included under the current land-use scenario, are the:

- **Groundskeeper.** The ranges are not currently maintained and will not be in the future.



- **Construction Worker.** The site is unused, and no development or construction is occurring or scheduled.
- **Resident.** The site is not currently used for residential purposes.

Future land-use in this area is shown as remediation reserve and passive recreation (FTMC, 1997). The sites may not be deemed safe for public access until remediation has been completed because of the potential for UXO (FTMC, 1997). Plausible future land-use receptor scenarios addressed in the CSEM include:

- **Resident.** Although the site is not planned for residential use, the residential scenario is considered in order to provide information for the project manager and regulators.
- **Recreational Site User.** Because the site is planned for passive recreational use in the future, and hunting is a viable option, the recreational site user is included. Fish ingestion will not be evaluated because the streams are too small to support fish for consumption.

A summary of relevant contaminant release and transport mechanisms, source and exposure media, and receptors and exposure pathways for this site is provided in Table 3-1 and Figure 3-1.

### **3.4 Decision-Making Process, Data Uses, and Needs**

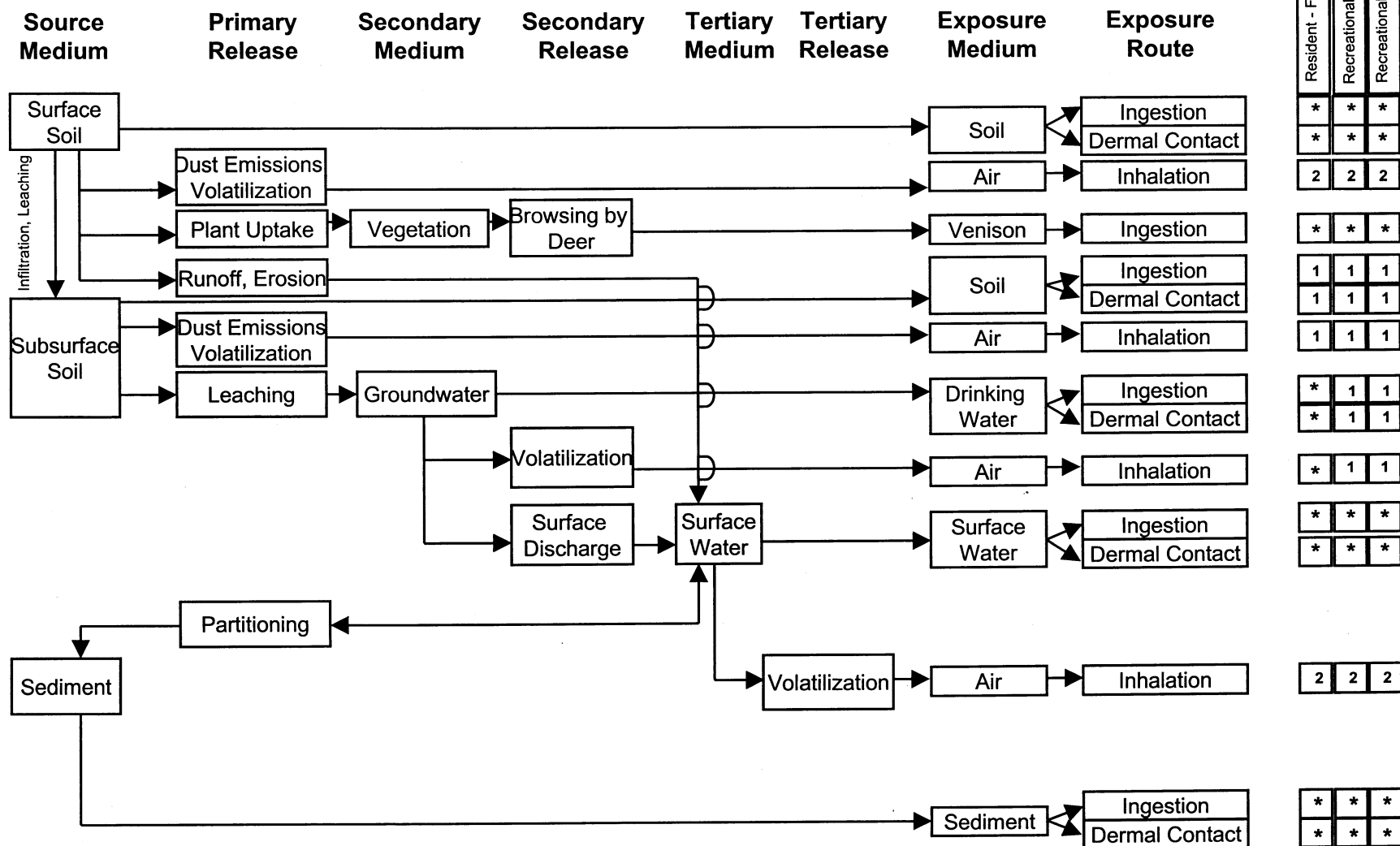
The decision-making process is a seven-step process that is presented in detail in Section 4.3 of the WP. This process will be followed during the SI at Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X. Data uses and needs are summarized in Table 3-1.

#### **3.4.1 Risk Evaluation**

Confirmation of contamination at Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X, will be based on using EPA definitive data to determine whether or not PSSCs are detected in site media. Detected site chemical concentrations will be compared to site-specific screening levels, ecological screening values, and background values to determine if PSSCs are present at the site at concentrations that pose an unacceptable risk to human health or the environment. Definitive data will be adequate for confirming the presence of site contamination and for supporting a feasibility study and risk assessment.

**Figure 3-1**  
**Generic Human Health Conceptual Site Exposure Model**  
**Parcels 92Q-X, 93Q-X, 107Q-X, 133Q-X, and 134Q-X**  
**Fort McClellan, Alabama**

**Receptor Scenarios**



\* = Complete exposure pathway evaluated in the streamlined risk assessment.

1 = Incomplete exposure pathway.

2 = Although theoretically complete, this pathway is judged to be insignificant and is not evaluated in the streamlined risk assessment.

### **3.4.2 Data Types and Quality**

Surface soil, subsurface soil, groundwater, surface water, and sediment will be sampled and analyzed to meet the objectives of the SI at Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X.

Quality assurance/quality control (QA/QC) samples will be collected for all sample types as described in Chapter 4.0 of this SFSP. Samples will be analyzed by EPA-approved SW-846 Methods Update III, where available, comply with EPA definitive data requirements, and be reported using hard-copy data packages. In addition to meeting the quality needs of this SI, data analyzed at this level of quality are appropriate for all phases of site characterization, remedial investigation, and risk assessment.

### **3.4.3 Precision, Accuracy, and Completeness**

Laboratory requirements of precision, accuracy, and completeness for this SI are provided in Section 9.0 of the QAP (IT, 2000a).

## **4.0 Field Activities**

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### **4.1 UXO Survey Requirements and Utility Clearances**

Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X, fall within the "Possible Explosive Ordnance Impact Areas" shown on Plate 10 of the *Archives Search Report, Maps, Fort McClellan, Anniston, Alabama* (USACE, 1999a). Therefore, IT will conduct UXO avoidance activities, including surface sweeps and downhole surveys of soil borings. The site-specific UXO safety plan provides technical guidance for ordnance and explosives avoidance during sample collection activities at Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X. The site-specific UXO safety plan attachment has been written in conjunction with Appendix E of the SAP (IT, 2000a).

#### **4.1.1 Surface UXO Survey**

A UXO sweep will be conducted over areas that will be included in the sampling and surveying activities to identify UXO on or near the surface that may present a hazard to on-site workers during field activities. Low-sensitivity magnetometers will be used to locate surface and shallow-buried metal objects. UXO located on the surface will be identified and conspicuously marked for easy avoidance. Subsurface metallic anomalies will not be disturbed, but will also be marked for easy avoidance. UXO personnel requirements, procedures, and detailed descriptions of the geophysical equipment to be used are provided in Chapter 4.0 and Appendices D and E of the approved SAP (IT, 2000a).

#### **4.1.2 Downhole UXO Survey**

During the soil boring and downhole sampling, downhole UXO surveys will be performed to determine if buried metallic objects are present. UXO monitoring, as described in Chapter 4.0 of the SAP (IT, 2000a), will continue until undisturbed soils are encountered or the borehole has been advanced to 12 feet below ground surface (bgs), whichever is reached first.

#### **4.1.3 Utility Clearances**

After the UXO surface survey has cleared the area to be sampled and prior to performing any intrusive sampling, a utility clearance will be performed at locations where soil and groundwater samples will be collected, using the procedure outlined in Section 4.2.6 of the SAP (IT, 2000a). The site manager will mark the proposed locations with stakes, coordinate with the local utility companies to clear the proposed locations for utilities, and obtain digging permits. Once the

locations are approved (for both UXO and utility avoidance) for intrusive sampling, the stakes will be labeled as cleared.

## **4.2 Environmental Sampling**

The environmental sampling program at Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X, includes the collection of surface soil, subsurface soil, groundwater, surface water, and sediment samples for chemical analyses. These samples will be collected and analyzed to provide data for characterizing the site to determine the environmental condition and any further action to be conducted at the site. Additionally, samples will be collected from environmental media in locations that will assist in the assessment of potential ecological impacts resulting from activities at the site.

### **4.2.1 Surface Soil Sampling**

Surface soil samples will be collected from 36 locations at Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X.

#### **4.2.1.1 Sample Locations and Rationales**

The surface soil sampling locations and rationales are listed in Table 4-1. Proposed sampling locations are shown in Figure 4-1. Surface soil sample designations and QA/QC sample requirements are summarized in Table 4-2. The final soil sampling locations will be determined in the field by the on-site geologist, based on actual field conditions.

#### **4.2.1.2 Sample Collection**

Surface soil samples will be collected from the upper 1 foot of soil by direct-push methodology or 3-inch diameter stainless-steel hand auger using the methods specified in Section 4.7.1.1 and Section 4.9 of the SAP, respectively (IT, 2000a). Collected soil samples will be screened using a photoionization detector (PID) in accordance with Section 4.15 of the SAP. Surface soil samples will be screened for information purposes only and not to select samples for analysis. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1, of the QAP. Sample documentation and chain-of-custody (COC) will be recorded as specified in Section 4.13 of the SAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

Table 4-1

**Sampling Locations and Rationales**  
**Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range,**  
**Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X**  
**Fort McClellan, Alabama**

(Page 1 of 5)

Parcel Number	Sample Location	Sample Media	Sample Location Rationale
92Q-X	HR-92Q-GP01	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be located approximately 625 feet southeast of the former firing area for Parcel 92Q-X, approximately 20 feet northwest (downslope) of a large mound. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
	HR-92Q-GP02	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be located on the large mound, approximately 625 feet southeast of the former firing area for Parcel 92Q-X. Samples will be collected from the surface and subsurface of the mound. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
	HR-92Q-GP03	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be located approximately 625 feet southeast of the former firing area for Parcel 92Q-X. Samples to be collected approximately 20 feet southeast (upslope) of the large mound. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
	HR-92Q-GP04	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be located near the central portion of Parcel 92Q-X, just west of the parcel boundary, from the surface and subsurface of the berm where objects resembling targets were seen on early aerial photographs. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
	HR-92Q-GP05	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be located near the central portion of Parcel 92Q-X. Surface and subsurface soil samples will be collected from within a northeast-southwest trending trench. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
	HR-92Q-GP06	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be located in the southeastern portion of parcel 92Q-X in the area of depressions and an underground bunker. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
	HR-92Q-GP07	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be located in the southeastern portion of parcel 92Q-X in an area of pop-up target pits. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
	HR-92Q-GP08	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be located just west of the boundary of Parcel 92Q-X, within an area of pop-up target pits and a dismantled brick building. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
	HR-92Q-GP09	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be located in the southeastern portion of Parcel 92Q-X, approximately 20 feet northwest of a large mound. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
	HR-92Q-GP10	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be located in the large mound at the southeastern portion of Parcel 92Q-X. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
	HR-92Q-GP11	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be located approximately 20 feet southeast of the large mound in the southeastern portion of Parcel 92Q-X. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.

Table 4-1

**Sampling Locations and Rationales**  
**Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range,**  
**Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X**  
**Fort McClellan, Alabama**

(Page 2 of 5)

Parcel Number	Sample Location	Sample Media	Sample Location Rationale
	HR-92Q-MW01	Surface soil subsurface soil and groundwater	Soil boring for surface soil, subsurface soil, and groundwater samples to be located in Parcel 92Q-X, adjacent and upslope of the former firing area. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes. The monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.
	HR-92Q-MW02	Surface soil subsurface soil and groundwater	Soil boring for surface soil, subsurface soil, and groundwater samples to be located approximately 625 feet southeast of the former firing area in Parcel 92Q-X in an area of depressions and trenches, within the area of heavy use observed in early aerial photographs. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes. The monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.
	HR-92Q-MW03	Surface soil subsurface soil and groundwater	Soil boring for surface soil, subsurface soil, and groundwater samples to be located in the central portion of Parcel 92Q-X, downslope of the impact area. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes. The monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.
	HR-92Q-MW04	Surface soil subsurface soil and groundwater	Soil boring for surface soil, subsurface soil, and groundwater samples to be located in Parcel 92Q-X along Syracuse Street, downslope of the impact area and near two fence posts where a quart of hydraulic fuel was located. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes. The monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.
93Q-X	HR-93Q-GP01	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be located in the former firing area for Parcel 93Q-X from within the large trench. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
	HR-93Q-GP02	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be located west of Parcel 93Q-X in an area of 55-gallon drums (used as target practice) and miscellaneous metal objects. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
	HR-93Q-GP03	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be located east of Parcel 93Q-X, within the large trench containing metal rods. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
	HR-93Q-GP04	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be located near the eastern boundary of Parcel 93Q-X, in the area of heavy use seen on early aerial photographs. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
	HR-93Q-GP05	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be located near the western boundary of Parcel 93Q-X, in an area of 55-gallon drums. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
	HR-93Q-GP06	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be located near the central portion of Parcel 93Q-X at one of the northernmost mounds along the creek in Parcel 93Q-X. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.

Table 4-1

**Sampling Locations and Rationales**  
**Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range,**  
**Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X**  
**Fort McClellan, Alabama**

(Page 3 of 5)

Parcel Number	Sample Location	Sample Media	Sample Location Rationale
HR-93Q-GP07		Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be located west of Parcel 93Q-X, in the area of a large ground scar that appears on early aerial photographs. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
HR-93Q-GP08		Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be located near the southern boundary of Parcel 93Q-X, downslope of an area of 55-gallon drums (used as target practice). Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
HR-93Q-MW01		Surface soil subsurface soil and groundwater	Soil boring for surface soil, subsurface soil, and groundwater samples to be located along the former firing line for Parcel 93Q-X, on the southern side of the berm that accompanies the large trench. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes. The monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.
HR-93Q-MW02		Surface soil subsurface soil and groundwater	Soil boring for surface soil, subsurface soil, and groundwater samples to be located east of the former firing area for Parcel 93Q-X, within an area of pop-up target pits. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes. The monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.
HR-93Q-MW03		Surface soil subsurface soil and groundwater	Soil boring for surface soil, subsurface soil, and groundwater samples to be located in the center of the impact area of Parcel 93Q-X, in the area of heavy use observed on early aerial photographs. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes. The monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.
HR-93Q-MW04		Surface soil subsurface soil and groundwater	Soil boring for surface soil, subsurface soil, and groundwater samples to be located near the southwestern boundary of Parcel 93Q-X, in the ground scar where a pile of 2.36 inch mortar fins and pieces were found. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes. The monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.
HR-93Q-SW/SD01		Surface water and Sediment	Surface water and sediment samples will be collected west of the former firing line of Parcel 93Q-X, downgradient of an area 55-gallon drums (used as target practice) and miscellaneous metal objects, in the creek that flows northwest across the parcel. Sample data will indicate if contaminant releases have occurred from runoff in the area of Parcel 93Q-X. Sample data will also be used to assess potential impacts to aquatic biota in the creek and other ecological receptors that may utilize the creek for food and/or habitat purposes.
HR-93Q-SW/SD02		Surface water and Sediment	Surface water and sediment samples to be located just south of the area of investigation, near the southern boundary of Parcel 93Q-X, from a tributary of the main creek that flows northwest across the parcel and is located upgradient from the training aids found at this site. Sample data will indicate if contaminant releases have occurred from runoff in the area of Parcel 93Q-X. Sample data will also be used to assess potential impacts to aquatic biota in the creek and other ecological receptors that may utilize the creek for food and/or habitat purposes.
HR-93Q-SW/SD03		Surface water and Sediment	Surface water and sediment samples to be located at the tributary that enters the southeastern corner of Parcel 93Q-X upgradient from the area of investigation, and upgradient from the training aids found at this site. Sample data will indicate if contaminant releases have occurred from runoff in the area of Parcel 93Q-X. Sample data will also be used to assess potential impacts to aquatic biota in the creek and other ecological receptors that may utilize the creek for food and/or habitat purposes.



Table 4-1

**Sampling Locations and Rationales**  
**Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range,**  
**Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X**  
**Fort McClellan, Alabama**

(Page 4 of 5)

Parcel Number	Sample Location	Sample Media	Sample Location Rationale
107Q-X	HR-107Q-GP01	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be located approximately 150 feet southeast of the former firing area in Parcel 107Q-X, near the center of an area of mounds and depressions. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
	HR-107Q-GP02	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be located approximately 400 feet southeast of the former firing area for Parcel 107Q-X, within the northeast-southwest trending trench located along the hillside. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
	HR-107Q-MW01	Surface soil subsurface soil and groundwater	Soil boring for surface soil, subsurface soil, and groundwater samples to be located just northeast of the area of trenches located in the former firing area for Parcel 107Q-X. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes. The monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.
	HR-107Q-MW02	Surface soil subsurface soil and groundwater	Soil boring for surface soil, subsurface soil, and groundwater samples to be located in Parcel 107Q-X, approximately 250 feet southeast of the former firing area, near the base of the hill where trenches and target pits were found. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes. The monitoring well location will be used to establish a local groundwater flow direction and site-specific geology, and provide information on groundwater quality in the residuum aquifer.
133Q-X	HR-133Q-GP01	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be located in the northern portion of Parcel 133Q-X at the southernmost mound along the creek in Parcel 133Q-X. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
	HR-133Q-GP02	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be located near the central portion of Parcel 133Q-X, downslope of the impact area, near the base of the hill. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
	HR-133Q-GP03	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be located in the western portion of Parcel 133Q-X downslope of an area of intact 55-gallon drums. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
	HR-133Q-SEEP01	Surface water and Sediment	Seep water and sediment samples will be collected at the seep that discharges into the main creek flowing northwest across the parcel in the eastern portion of Parcel 93Q-X. Sample data will indicate if contaminant releases have occurred from runoff in the area of Parcel 93Q-X. Sample data will also be used to assess potential impacts to aquatic biota in the creek and other ecological receptors that may utilize the creek for food and/or habitat purposes.
	HR-133Q-SW/SD01	Surface water and Sediment	Surface water and sediment samples will be collected from a creek that flows northwest across the parcel and is located downgradient of the impact area, near the central portion of Parcel 133Q-X. Sample data will indicate if contaminant releases have occurred from runoff in the area of Parcel 133Q-X. Sample data will also be used to assess potential impacts to aquatic biota in the creek and other ecological receptors that may utilize the creek for food and/or habitat purposes.

**Table 4-1**

**Sampling Locations and Rationales  
Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range,  
Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X  
Fort McClellan, Alabama**

(Page 5 of 5)

Parcel Number	Sample Location	Sample Media	Sample Location Rationale
134Q-X	HR-134Q-GP01	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to be located near the northeastern boundary of Parcel 134Q-X, downgradient of the impact area and an area of shallow depressions. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
	HR-134Q-GP02	Surface soil and subsurface soil	Soil boring for surface soil and subsurface soil samples to located near the northwestern boundary of Parcel 134Q-X, downgradient of the impact area and an area of shallow depressions. Sample data will indicate if contaminant releases into the environment have occurred from former activities at this area of the site and if contaminated soil exists at this location. Soil sample data will also be used to assess potential impacts to terrestrial biota that might utilize the site for food and/or habitat purposes.
	HR-134Q-SW/SD01	Surface water and Sediment	Surface water and sediment samples will be collected from a creek that flows northwest across parcel 134Q-X and is located upgradient of the site and just east of the area of investigation. Sample data will also be used to assess potential impacts to aquatic biota in the creek and other ecological receptors that may utilize the creek for food and/or habitat purposes.
	HR-134Q-SW/SD02	Surface water and Sediment	Surface water and sediment samples will be collected in the central portion of Parcel 134Q-X. Samples will be collected from a creek that flows northwest across the parcel. Sample data will also be used to assess potential impacts to aquatic biota in the creek and other ecological receptors that may utilize the creek for food and/or habitat
	HR-134Q-SW/SD03	Surface water and Sediment	Surface water and sediment samples will be collected from a creek that flows northwest across parcel 134Q-X and is located northeast and downgradient of the area of investigation. Sample data will also be used to assess potential impacts to aquatic biota in the creek and other ecological receptors that may utilize the creek for food and/or habitat purposes.



Table 4-2

**Surface and Subsurface Soil Sample Designations and QA/QC Sample Quantities  
Parcels 92Q-X, 93Q-X, 107Q-X, 133Q-X, and 134Q-X  
Fort McClellan, Alabama**

(Page 1 of 4)

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
HR-92Q-GP01	HR-92Q-GP01-SS-PS0001-REG	0-1			HR-92Q-GP01-SS-PS0001-MS/MSD	TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-92Q-GP01-DS-PS0002-REG	a				
HR-92Q-GP02	HR-92Q-GP02-SS-PS0003-REG	0-1	HR-92Q-GP02-SS-PS0004-FD			TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-92Q-GP02-DS-PS0005-REG	a				
HR-92Q-GP03	HR-92Q-GP03-SS-PS0006-REG	0-1				TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-92Q-GP03-DS-PS0007-REG	a				
HR-92Q-GP04	HR-92Q-GP04-SS-PS0008-REG	0-1				TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-92Q-GP04-DS-PS0009-REG	a				
HR-92Q-GP05	HR-92Q-GP05-SS-PS0010-REG	0-1			HR-92Q-GP05-SS-PS0010-MS/MSD	TAL Metals, Nitroaromatic/Nitramine Explosives, VOCs, SVOCs, CI and OP Pesticides, and CI Herbicides
	HR-92Q-GP05-DS-PS0011-REG	a				
HR-92Q-GP06	HR-92Q-GP06-SS-PS0012-REG	0-1				TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-92Q-GP06-DS-PS0013-REG	a				
HR-92Q-GP07	HR-92Q-GP07-SS-PS0014-REG	0-1				TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-92Q-GP07-DS-PS0015-REG	a				
HR-92Q-GP08	HR-92Q-GP08-SS-PS0016-REG	0-1				TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-92Q-GP08-DS-PS0017-REG	a				
HR-92Q-GP09	HR-92Q-GP09-SS-PS0018-REG	0-1				TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-92Q-GP09-DS-PS0019-REG	a				
HR-92Q-GP10	HR-92Q-GP10-SS-PS0020-REG	0-1				TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-92Q-GP10-DS-PS0021-REG	a				



Table 4-2

**Surface and Subsurface Soil Sample Designations and QA/QC Sample Quantities  
Parcels 92Q-X, 93Q-X, 107Q-X, 133Q-X, and 134Q-X  
Fort McClellan, Alabama**

(Page 2 of 4)

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
HR-92Q-GP11	HR-92Q-GP11-SS-PS0022-REG	0-1				TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-92Q-GP11-DS-PS0023-REG	a				
HR-92Q-MW01	HR-92Q-MW01-SS-PS0024-REG	0-1				TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-92Q-MW01-DS-PS0025-REG	a				
HR-92Q-MW02	HR-92Q-MW02-SS-PS0026-REG	0-1				TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-92Q-MW02-DS-PS0027-REG	a				
HR-92Q-MW03	HR-92Q-MW03-SS-PS0028-REG	0-1				TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-92Q-MW03-DS-PS0029-REG	a				
HR-92Q-MW04	HR-92Q-MW04-SS-PS0030-REG	0-1	HR-92Q-MW04-SS-PS0031-FD			TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-92Q-MW04-DS-PS00332-REG	a				
HR-93Q-GP01	HR-93Q-GP01-SS-PT0001-REG	0-1				TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-93Q-GP01-DS-PT0002-REG					
HR-93Q-GP02	HR-93Q-GP02-SS-PT0003-REG	0-1	HR-93Q-GP02-SS-PT0004-FD			TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-93Q-GP02-DS-PT0005-REG					
HR-93Q-GP03	HR-93Q-GP03-SS-PT0006-REG	0-1				TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-93Q-GP03-DS-PT0007-REG					
HR-93Q-GP04	HR-93Q-GP04-SS-PT0008-REG	0-1				TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-93Q-GP04-DS-PT0009-REG	a				

Table 4-2

**Surface and Subsurface Soil Sample Designations and QA/QC Sample Quantities  
Parcels 92Q-X, 93Q-X, 107Q-X, 133Q-X, and 134Q-X  
Fort McClellan, Alabama**

(Page 3 of 4)

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
HR-93Q-GP05	HR-93Q-GP05-SS-PT0010-REG	0-1				TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-93Q-GP05-DS-PT0011-REG	a				
HR-93Q-GP06	HR-93Q-GP06-SS-PT0012-REG	0-1				TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-93Q-GP06-DS-PT0013-REG	a				
HR-93Q-GP07	HR-93Q-GP07-SS-PT0014-REG	0-1				TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-93Q-GP07-DS-PT0015-REG	a	HR-93Q-GP07-DS-PT0016-FD			
HR-93Q-GP08	HR-93Q-GP08-SS-PT0017-REG	0-1				TAL Metals, Nitroaromatic/Nitramine Explosives, VOCs, SVOCs, CI and OP Pesticides, and CI Herbicides
	HR-93Q-GP08-DS-PT0018-REG	a			HR-93Q-GP08-DS-PT0018-MS/MSD	
HR-93Q-MW01	HR-93Q-MW01-SS-PT0019-REG	0-1				TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-93Q-MW01-DS-PT0020-REG	a				
HR-93Q-MW02	HR-93Q-MW02-SS-PT0021-REG	0-1				TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-93Q-MW02-DS-PT0022-REG	a				
HR-93Q-MW03	HR-93Q-MW03-SS-PT0023-REG	0-1				TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-93Q-MW03-DS-PT0024-REG	a				
HR-93Q-MW04	HR-93Q-MW04-SS-PT0025-REG	0-1				TAL Metals, Nitroaromatic/Nitramine Explosives, VOCs, SVOCs, CI and OP Pesticides, and CI Herbicides
	HR-93Q-MW04-DS-PT0026-REG	a				
HR-107Q-GP01	HR-107Q-GP01-SS-PU0001-REG	0-1				TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-107Q-GP01-DS-PU0002-REG	a				

Table 4-2

**Surface and Subsurface Soil Sample Designations and QA/QC Sample Quantities  
Parcels 92Q-X, 93Q-X, 107Q-X, 133Q-X, and 134Q-X  
Fort McClellan, Alabama**

(Page 4 of 4)

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
HR107Q-GP02	HR107Q-GP02-SS-PU0003-REG	0-1			HR107Q-GP02-SS-PU0003-MS/MSD	TAL Metals and Nitroaromatic/Nitramine Explosives
	HR107Q-GP02-DS-PU0004-REG	a				
HR107Q-MW01	HR107Q-MW01-SS-PU0005-REG	0-1	HR107Q-MW01-SS-PU0006-FD			TAL Metals and Nitroaromatic/Nitramine Explosives
	HR107Q-MW01-DS-PU0007-REG	a				
HR-107Q-MW02	HR-107Q-MW02-SS-PU0008-REG	0-1				TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-107Q-MW02-DS-PU0009-REG	a				
HR-133Q-GP01	HR-133Q-GP01-SS-PV0001-REG	0-1				TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-133Q-GP01-DS-PV0002-REG	a				
HR-133Q-GP02	HR-133Q-GP02-SS-PV0003-REG	0-1	HR-133Q-GP02-SS-PV0004-FD			TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-133Q-GP02-DS-PV0005-REG	a				
HR-133Q-GP03	HR-133Q-GP03-SS-PV0006-REG	0-1			HR-133Q-GP03-SS-PV0006-MS/MSD	TAL Metals, Nitroaromatic/Nitramine Explosives, VOCs, SVOCs, CI and OP Pesticides, and CI Herbicides
	HR-133Q-GP03-DS-PV0007-REG	a				
HR-134Q-GP01	HR-134Q-GP01-SS-PX0001-REG	0-1				TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-134Q-GP01-DS-PX0002-REG	a				
HR-134Q-GP02	HR-134Q-GP02-SS-PX0003-REG	0-1	HR-134Q-GP02-DS-PX0005-FD			TAL Metals and Nitroaromatic/Nitramine Explosives
	HR-134Q-GP02-DS-PX0004-REG	a				

<sup>a</sup> Actual sample depth selected for analysis will be at the discretion of the site geologist and will be based on field observation.

CI and Op - Chlorinated and Organophosphorous  
FD - Field duplicate.  
MS/MSD - Matrix spike/matrix spike duplicate.  
QA/QC - Quality assurance/quality control.  
REG - Field sample.

SVOCs - Semivolatile organic compounds.  
TAL - Target analyte list.  
TCL - Target compound list.  
VOCs - Volatile organic compounds.

## **4.2.2 Subsurface Soil Sampling**

Subsurface soil samples will be collected from 36 boring locations at Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X.

### **4.2.2.1 Sample Locations and Rationales**

Subsurface soil samples will be collected from the soil borings proposed on Figure 4-1. The subsurface soil sampling rationales are listed in Table 4-1. Subsurface soil samples to be collected are listed in Table 4-2. The final soil boring sampling locations will be determined in the field by the on-site geologist, based on actual field observations and utility and UXO clearance results.

### **4.2.2.2 Sample Collection**

Subsurface soil samples will be collected from soil borings at a depth greater than 1 foot bgs in the unsaturated zone. The soil borings will be advanced and soil samples collected using the direct-push sampling procedures specified in Section 4.7.1.1 of the SAP (IT, 2000a). In areas where site access does not permit the use of a direct-push rig, the samples will be collected using a hand auger.

Soil samples will be collected continuously for the first four feet. The on-site geologist will record a detailed lithological log for each borehole. At least one subsurface sample from each borehole will be selected for analysis. The collected subsurface soil samples will be field-screened using a PID in accordance with Section 4.15 of the SAP to measure samples exhibiting elevated readings exceeding background (readings in ambient air). Typically, the subsurface soil sample showing the highest reading (above background) will be selected and sent to the laboratory for analysis. If none of the samples indicate readings exceeding background using the PID, the deepest interval from the soil boring will be sampled and submitted to the laboratory for analysis. Subsurface soil samples may be selected for analysis from any depth interval if the on-site geologist suspects PSSCs at the interval. Site conditions such as lithology may also determine the actual sample depth interval submitted for analysis. The depth of the boring may be extended beyond four feet bgs and more than one subsurface soil sample may be collected if field measurements and observations indicate a possible layer of PSSCs and/or additional sample data would provide insight to the existence of any PSSCs.



Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP.

Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1, of the QAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

#### **4.2.3 Permanent Residuum Monitoring Wells**

Ten permanent residuum monitoring wells will be installed at Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X. The permanent residuum monitoring well locations are shown on Figure 4-1. The final monitoring well locations will be determined in the field by the on-site geologist, based on actual field conditions. The rationales for the monitoring well locations are presented in Table 4-1. The monitoring well boreholes will be drilled to the top of bedrock, or until adequate groundwater is encountered to install a well with a 10-to-20 foot screen. Monitoring wells will be installed using a truck-mounted or all-terrain-vehicle-mounted hollow-stem auger drill rig. The monitoring well casing will consist of new 2-inch inside-diameter, Schedule 40, threaded, flush-joint, polyvinyl chloride (PVC) pipe. Attached to the bottom of the well casing will be a section of new threaded, flush-joint, 0.010-inch continuous wrap PVC well screen, approximately 10 to 20 feet long. At the discretion of the IT site manager, a sump (composed of new, 2-inch inside diameter, Schedule 40, threaded, flush-joint PVC) may be attached to the bottom of the well screen. After the casing and screen materials are lowered into the boring, a filter pack will be installed around the well screen. In wells installed to depths of more than 20 feet, the filter pack material will be gravity filled. In wells installed to depths of more than 20 feet, the filter pack will be tremied into place. The filter pack will be installed from the bottom of the well to approximately five feet above the top of the well screen. The filter pack will consist of 20/40 (Number 1) silica sand. A fine sand layer (30/70 silica sand), approximately five feet thick, may be placed above the filter pack. A bentonite seal, approximately five feet thick, will be placed above the filter pack (or the fine sand, if used). The remaining annular space will be grouted with a bentonite-cement mixture, using approximately 7 to 8 gallons of water and approximately 5 pounds of bentonite per 94-pound bag of Type I or Type II Portland cement. The grout will be tremied into place from the top of the bentonite seal to ground surface.

Soil samples for lithology will be collected starting at five feet bgs and will continue at five-foot intervals thereafter, to the total depth of the borehole. Lithologic samples will be described to provide a detailed lithologic log. The samples will be collected for lithology using a 24-inch long, 2-inch (or larger) diameter, split-spoon sampler. The soil borings will be logged in

Table 4-3

**Groundwater Sample Designations and QA/QC Sample Quantities  
Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range,  
Parcel 107Q-X, Former Impact Areas, Parcels 133Q-X and 134Q-X  
Fort McClellan, Alabama**

Sample Location	Sample Designation	Sample Matrix <sup>a</sup>	QA/QC Samples	Field Splits	MS/MSD	Analytical Suite
			Field Duplicates			
HR-92Q-MW01	HR-92Q-MW01-GW-PS3001-REG	Groundwater				TAL Metals and Nitroaromatic/Nitramine Explosives
HR-92Q-MW02	HR-92Q-MW02-GW-PS3002-REG	Groundwater				TAL Metals and Nitroaromatic/Nitramine Explosives
HR-92Q-MW03	HR-92Q-MW03-GW-PS3004-REG	Groundwater				TAL Metals and Nitroaromatic/Nitramine Explosives
HR-92Q-MW04	HR-92Q-MW04-GW-PS3005-REG	Groundwater				TAL Metals and Nitroaromatic/Nitramine Explosives
HR-93Q-MW01	HR-93Q-MW01-GW-PT3001-REG	Groundwater				TAL Metals and Nitroaromatic/Nitramine Explosives
HR-93Q-MW02	HR-93Q-MW02-GW-PT3003-REG	Groundwater				TAL Metals and Nitroaromatic/Nitramine Explosives
HR-93Q-MW03	HR-93Q-MW03-GW-PT3004-REG	Groundwater				TAL Metals and Nitroaromatic/Nitramine Explosives
HR-93Q-MW04	HR-93Q-MW04-GW-PT3005-REG	Groundwater			HR-93Q-MW03-GW-PT3004-MS/MSD	TAL Metals, Nitroaromatic/Nitramine Explosives VOCs, SVOCs, CL and OP Pesticides, and CL Herbicides
HR-107Q-MW01	HR-107Q-MW01-GW-PU3001-REG	Groundwater	HR-107Q-MW01-GW-PU3002-FD			TAL Metals and Nitroaromatic/Nitramine Explosives
HR-107Q-MW02	HR-107Q-MW02-GW-PU3003-REG	Groundwater				TAL Metals and Nitroaromatic/Nitramine Explosives

<sup>a</sup> Groundwater samples will be collected from the approximate midpoint of the saturated screened interval of the monitoring well.

Cl and Op - Chlorinated and Organophosphorous.

FD - Field duplicate.

MS/MSD - Matrix spike/matrix spike duplicate.

QA/QC - Quality assurance/quality control.

REG - Field sample.

SVOCs - Semivolatile organic compounds.

TAL - Target analyte list.

TCL - Target compound list.

VOCs - Volatile organic compounds.

accordance with American Standard for Testing and Materials Method D 2488 using the Unified Soil Classification System. The soil samples will be screened in the field using a PID. The monitoring wells will be drilled, installed, and developed as specified in Section 4.8 and Appendix C of the SAP (IT, 2000a). Monitoring wells will be allowed to equilibrate for 14 days after well development prior to collecting groundwater samples.

#### **4.2.4 Groundwater Sampling**

Groundwater samples will be collected from the 10 monitoring wells completed in Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X, as presented in Section 4.2.3.

##### **4.2.4.1 Sample Locations and Rationales**

Groundwater samples will be collected from the monitoring well locations shown on Figure 4-1. The groundwater sampling rationales are listed in Table 4-1. The groundwater sample designations, depths, and QA/QC sample quantities are listed in Table 4-3.

##### **4.2.4.2 Sample Collection**

Prior to sampling monitoring wells, static water level will be measured from each of the monitoring wells installed at the site to define the groundwater flow in the residuum aquifer. Water level measurements will be performed as outlined in Section 4.18 of the SAP (IT, 2000a). Groundwater samples will be collected in accordance with the procedures outlined in Section 4.9.1.4 of the SAP. Low-flow groundwater sampling methodology outlined in the August 2000 letter report to USACE (IT, 2000b) may be used as deemed necessary by the IT site manager.

Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1, of the QAP (IT, 2000a). The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

#### **4.2.5 Surface Water Sampling**

Seven surface water samples and 1 seep sample will be collected from Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X. Surface water samples will be collected from the drainage ditches/creeks as shown on Figure 4-1.

#### **4.2.5.1 Sample Locations and Rationales**

The surface water sampling rationales are listed in Table 4-1. The surface water samples will be collected from the proposed locations on Figure 4-1. The surface water sample designations and QA/QC sample requirements are listed in Table 4-4. The exact sampling locations will be determined in the field by the ecological sampler, based on drainage pathways and actual field observations.

#### **4.2.5.2 Sample Collection**

The surface water samples will be collected in accordance with the procedures specified in Section 4.9.1.3 of the SAP (IT, 2000a). Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1, of the QAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

#### **4.2.6 Sediment Sampling**

Eight sediment samples will be collected from the site of Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X. These sediment samples will be collected at the same locations as the surface water samples described in Section 4.2.5.

##### **4.2.6.1 Sample Locations and Rationales**

The proposed locations for the sediment samples are shown in Figure 4-1. Sediment sampling rationales are presented in Table 4-1. The sediment sample designations and QA/QC sample requirements are listed in Table 4-4. The actual sediment sample points will be at the discretion of the ecological sampler, based on the drainage pathways and field observations.

##### **4.2.6.2 Sample Collection**

The sediment samples will be collected in accordance with the procedures specified in Section 4.9.1.2 of the SAP. Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP. The sediment samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

#### **4.3 Decontamination Requirements**

Decontamination will be performed on sampling and nonsampling equipment to prevent cross-contamination between sampling locations. Decontamination of sampling equipment will be



Table 4-4

**Surface Water and Sediment Sample Designations and QA/QC Sample Quantities**  
**Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Tank Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X**  
**Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Designation	Sample Matrix	Sample Depth (ft)	QA/QC Samples			Analytical Suite
				Field Duplicates	Field Splits	MS/MSD	
HR-93Q-SW/SD01	HR-93Q-SW/SD01-SW-PT2001-REG	surface water	a	HR-93Q-SW/SD01-SW-PT2002-FD			TAL Metals and Nitroaromatic/Nitramine Explosives TOC, Grain Size (sediment only)
	HR-93Q-SW/SD01-SD-PT1001-REG	sediment	0-0.5	HR-93Q-SW/SD01-SD-PT1002-FD			
HR-93Q-SW/SD02	HR-93Q-SW/SD02-SW-PT2003-REG	surface water	a				TAL Metals and Nitroaromatic/Nitramine Explosives TOC, Grain Size (sediment only)
	HR-93Q-SW/SD02-SD-PT1003-REG	sediment	0-0.5				
HR-93Q-SW/SD03	HR-93Q-SW/SD03-SW-PT2004-REG	surface water	a			HR-93Q-SW/SD03-SW-PT2004-MS/MSD	TAL Metals, Nitroaromatic/Nitramine Explosives, VOCs SVOCs, CI and OP Pesticides, CI Herbicides and TOC and Grain Size (sediment only)
	HR-93Q-SW/SD03-SD-PT1004-REG	sediment	0-0.5			HR-93Q-SW/SD03-SD-PT1004-MS-MSD*	
HR-133Q-SEEP01	HR-133Q-SEEP01-SEP-PV2001-REG	surface water	a				TAL Metals and Nitroaromatic/Nitramine Explosives TOC, Grain Size (sediment only)
	HR-133Q-SEEP01-SD-PV1001-REG	sediment	0-0.5				
HR-133Q-SW/SD01	HR-133Q-SW/SD01-SW-PV2002-REG	surface water	a				TAL Metals and Nitroaromatic/Nitramine Explosives TOC, Grain Size (sediment only)
	HR-133Q-SW/SD01-SD-PV1002-REG	sediment	0-0.5				
HR-134Q-SW/SD01	HR-134Q-SW/SD01-SW-PX2001-REG	surface water	a				TAL Metals and Nitroaromatic/Nitramine Explosives TOC, Grain Size (sediment only)
	HR-134Q-SW/SD01-SD-PX1001-REG	sediment	0-0.5				
HR-134Q-SW/SD02	HR-134Q-SW/SD02-SW-PX2002-REG	surface water	a				TAL Metals and Nitroaromatic/Nitramine Explosives TOC, Grain Size (sediment only)
	HR-134Q-SW/SD02-SD-PX1002-REG	sediment	0-0.5				
HR-134Q-SW/SD03	HR-134Q-SW/SD03-SW-PX2003-REG	surface water	a				TAL Metals and Nitroaromatic/Nitramine Explosives TOC, Grain Size (sediment only)
	HR-134Q-SW/SD03-SD-PX1003-REG	sediment	0-0.5				

<sup>a</sup> Sample depth will depend on where sufficient first water is encountered to collect a water sample.

\* TOC and grain size not analyzed for MS/MSD samples.

CI and OP - Chlorinated and Organophosphorous.

FD - Field duplicate.

MS/MSD - Matrix spike/matrix spike duplicate.

QA/QC - Quality assurance/quality control.

SVOCs - Semivolatile organic compounds.

TAL - Target analyte list.

TCL - Target compound list.

TOC - Total organic carbon

performed in accordance with the requirements presented in Section 4.10.1.1 of the SAP (IT, 2000a). Decontamination of nonsampling equipment will be performed in accordance with the requirements presented in Section 4.10.1.2 of the SAP.

#### **4.4 Surveying of Sample Locations**

Areas at this site must be cleared for UXO avoidance before any surveying activities will commence. Sampling locations will be marked with pin flags, stakes, and/or flagging and will be surveyed using either global positioning system (GPS) or conventional civil survey techniques, as necessary to obtain the required level of accuracy. Horizontal coordinates will be referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum, 1983. Elevations will be referenced to the North American Vertical Datum of 1988.

Horizontal coordinates for soil, sediment, and surface water locations will be recorded using a GPS to provide accuracy within 1 meter. Because of the need to use permanent monitoring wells to determine water levels, a higher level of accuracy is required. Monitoring wells will be surveyed to an accuracy of 0.1 foot for horizontal coordinates and 0.01 foot for elevations, using survey-grade GPS techniques and/or conventional civil survey techniques, as required. Procedures to be used for GPS surveying are described in Section 4.3 of the SAP. Conventional land survey requirements are presented in Section 4.19 of the SAP.

#### **4.5 Analytical Program**

Samples collected at locations specified in this chapter of this SFSP will be analyzed for specific suites of chemicals and elements based on the history of site usage, as well as EPA, ADEM, FTMC, and USACE requirements. Target analyses for samples collected from Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X, consist of the following list of analytical suites:

- Target analyte list metals - Method 6010B/7000.
- Nitroaromatic/nitramine explosives - Method 8330.

Approximately ten percent of the samples will be analyzed for the following list of analytical suites:

- Target compound list volatile organic compounds – Method 5035/8260B
- Target compound list semivolatile organic compounds – Method 8270C
- Chlorinated pesticides - Method 8081A

- Chlorinated herbicides - Method 8151A
- Organophosphorous pesticides - Method 8141A.

In addition, the sediment samples will be analyzed for the following list of parameters:

- Total Organic Carbon - Method 9060
- Grain Size - ASTM D-421/D-422.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Table 4-5 in this SFSP and Table 6-1 in the QAP. Data will be reported in accordance with the definitive data requirements of Chapter 2 of the USACE Engineering Manual 200-1-6, *Chemical Quality Assurance for Hazardous, Toxic and Radioactive Waste (HTRW) Projects* (USACE, 1997), and evaluated by the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP). Chemical data will be reported by the laboratory via hard-copy data packages using Contract Laboratory Program-like forms, along with electronic copies. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria.

#### **4.6 Sample Preservation, Packaging, and Shipping**

Sample preservation, packaging, and shipping will follow the procedures specified in Section 4.13.2 of the SAP (IT, 2000a). Completed analysis request/COC records will be secured and included with each shipment of coolers to:

Attn: Elizabeth McIntyre  
EMAX Laboratories, Inc.  
1835 205th Street  
Torrance, California 90501  
Telephone: (310) 618-8889.

#### **4.7 Investigation-Derived Waste Management**

Management and disposal of the investigation-derived wastes (IDW) will follow procedures and requirements described in Appendix D of the SAP (IT, 2000a). The IDW generated at Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X, is expected to include decontamination fluids, direct-push and hollow-stem auger cuttings, purge water from wells, and disposable personal protective equipment. The IDW will be staged in the fenced area surrounding Buildings 335 and 336 while awaiting final disposal.

Table 4-5

**Analytical Samples  
Site Investigation  
Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X  
Fort McClellan, Calhoun County, Alabama**

Parameters	Analysis Method	Sample Matrix	TAT Needed	Field Samples			QA/QC Samples <sup>a</sup>				EMAX	
				No. of Sample Points	No. of Events	No. of Field Samples	Field Dups (10%)	MS/MSD (5%)	Trip Blank (1/ship)	Eq. Rinse (1/wk/matrix)	Total No. Analysis	
Parcels 92Q-X, 93Q-X, 107Q-X, 133Q-X, and 134Q-X: 18 water matrix samples (10 groundwater samples, 7 surface water samples, and 1 seep sample); 80 soil matrix samples, 36 subsurface soil samples, and 8 sediment samples)												
Explosives	8330	water	normal	18	1	18	2	2	0	1	25	
TAL Metals	6010B/7000	water	normal	18	1	18	2	2	0	1	25	
TCL VOCs	8260B	water	normal	2	1	2	0	2	2	1	9	
TCL SVOCs	8270C	water	normal	2	1	2	0	2	0	1	7	
Chlorinated Pesticides	8081A	water	normal	2	1	2	0	2	0	1	7	
Organophosphorus Pesticides	8141A	water	normal	2	1	2	0	2	0	1	7	
Chlorinated Herbicides	8151A	water	normal	2	1	2	0	2	0	1	7	
Explosives	8330	soil	normal	80	1	80	8	6	0	2	102	
TAL Metals	6010B/7000	soil	normal	80	1	80	8	6	0	2	102	
TCL VOCs	8260B	soil	normal	8	1	8	0	4	0	2	18	
TCL SVOCs	8270C	soil	normal	8	1	8	0	4	0	2	18	
Chlorinated Pesticides	8081A	soil	normal	8	1	8	0	4	0	2	18	
Organophosphorus Pesticides	8141A	soil	normal	8	1	8	0	4	0	2	18	
Chlorinated Herbicides	8151A	soil	normal	8	1	8	0	4	0	2	18	
TOC	9060	soil	normal	8	1	8	0	0	0	0	8	
Grain Size ASTM D-421/D-422		soil	normal	8	1	8	0	0	0	0	8	
Parcels 92Q-X, 93Q-X,107Q-X, 133Q-X, and 134Q-X Subtotal:							262	20	46	2	21	397

<sup>a</sup>Field duplicate, QA split, and MS/MSD samples were calculated as a percentage of the field samples collected per site and were rounded to the nearest whole number.

Trip blank samples will be collected with water matrix samples for VOC analysis only. Assumed four field samples per day to estimate trip blanks. Equipment blanks will be collected once per event whenever sampling equipment is field decontaminated and re-used. They will be repeated weekly for sampling events that last more than 1 week. Assumed 20 field samples will be collected per week to estimate number of equipment blanks.

MS/MSD - Matrix spike/matrix spike duplicate.

Explosives - Nitroaromatic and Nitramine.

QA/QC - Quality assurance/quality control.

SVOCs - Semivolatile organic compounds.

TAL - Target analyte list.

TAT - Turn-around time

TCL - Target compound list.

VOCs - Volatile organic compounds.

Ship samples to: EMAX Laboratories, Inc.  
1835 205th Street  
Torrance, CA 90501  
Attn: Elizabeth McIntyre  
Tel: 310-618-8889  
Fax: 310-618-0818



#### ***4.8 Site-Specific Safety and Health***

Health and safety requirements for this SI are provided in the SSHP attachment for Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X. The SSHP attachment will be used in conjunction with the installation-wide safety and health plan.

## **5.0 Project Schedule**

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The project schedule for the SI activities will be provided by the IT project manager to the Base Realignment and Closure Cleanup Team.

## 6.0 References

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U.S. Department of Agriculture (USDA), 1961, ***Soil Survey, Calhoun County, Alabama***, Soil Conservation Service, Series 1958, No. 9, September 1961.

U.S. Environmental Protection Agency (EPA), 1993, ***Data Quality Objectives Process for Superfund, Interim Final Guidance***, EPA 540-R-93-071, September.

**ATTACHMENT 1**

**LIST OF ABBREVIATIONS AND ACRONYMS**

# List of Abbreviations and Acronyms

2,4-D	2,4-dichlorophenoxyacetic acid	BOD	biological oxygen demand	CWA	chemical warfare agent
2,4,5-T	2,4,5-trichlorophenoxyacetic acid	BRAC	Base Realignment and Closure	CWM	chemical warfare material; clear, wide mouth
2,4,5-TP	silvex	Braun	Braun Intertec Corporation	CX	dichloroformoxime
3D	3D International Environmental Group	BSC	background screening criterion	‘D’	duplicate; dilution
Abs	skin absorption	BTAG	Biological Technical Assistance Group	DAF	dilution-attenuation factor
Amsl	above mean sea level	BTEX	benzene, toluene, ethyl benzene, and xylenes	DANC	decontamination agent, non-corrosive
AC	hydrogen cyanide	BTOC	below top of casing	°C	degrees Celsius
AcB2	Anniston and Allen gravelly loams, 2 to 6 percent slopes, eroded	BTV	background threshold value	°F	degrees Fahrenheit
AcC2	Anniston and Allen gravelly loams, 6 to 10 percent slopes, eroded	BW	biological warfare	DCE	dichloroethene
AcD2	Anniston and Allen gravelly loams, 10 to 15 percent slopes, eroded	BZ	breathing zone; 3-quinuclidinyl benzilate	DDD	dichlorodiphenyldichloroethane
AcE2	Anniston and Allen gravelly loams, 15 to 25 percent slopes, eroded	C	ceiling limit value	DDE	dichlorodiphenyldichloroethene
ACGIH	American Conference of Governmental Industrial Hygienists	Ca	carcinogen	DDT	dichlorodiphenyltrichloroethane
ADEM	Alabama Department of Environmental Management	CAB	chemical warfare agent breakdown products	DEH	Directorate of Engineering and Housing
ADPH	Alabama Department of Public Health	CAMU	corrective action management unit	DEP	depositional soil
AEC	U.S. Army Environmental Center	CCAL	continuing calibration	DI	deionized
AEL	airborne exposure limit	CCB	continuing calibration blank	DID	data item description
AET	adverse effect threshold	CD	compact disc	DIMP	di-isopropylmethylphosphonate
AHA	ammunition holding area	CDTF	Chemical Defense Training Facility	DMBA	dimethylbenz(a)anthracene
AL	Alabama	CEHNC	U.S. Army Engineering and Support Center, Huntsville	DMMP	dimethylmethylphosphonate
ALAD	ä-aminolevulinic acid dehydratase	CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	DOD	U.S. Department of Defense
amb.	Amber	CERFA	Community Environmental Response Facilitation Act	DOJ	U.S. Department of Justice
amsl	above mean sea level	CESAS	Corps of Engineers South Atlantic Savannah	DOT	U.S. Department of Transportation
ANAD	Anniston Army Depot	CG	carbonyl chloride (phosgene)	DP	direct-push
AOC	area of concern	CFC	chlorofluorocarbon	DPDO	Defense Property Disposal Office
APT	armor-piercing tracer	CFDP	Center for Domestic Preparedness	DPT	direct-push technology
ARAR	applicable or relevant and appropriate requirement	ch	inorganic clays of high plasticity	DQO	data quality objective
AREE	area requiring environmental evaluation	CHPPM	U.S. Army Center for Health Promotion and Preventive Medicine	DRMO	Defense Reutilization and Marketing Office
ASP	Ammunition Supply Point	CK	cyanogen chloride	DRO	diesel range organics
ASR	Archives Search Report	cl	inorganic clays of low to medium plasticity	DS	deep (subsurface) soil
AST	aboveground storage tank	Cl.	chlorinated	DS2	Decontamination Solution Number 2
ASTM	American Society for Testing and Materials	CLP	Contract Laboratory Program	DWEL	drinking water equivalent level
ATSDR	Agency for Toxic Substances and Disease Registry	CN	chloroacetophenone	E&E	Ecology and Environment, Inc.
ATV	all-terrain vehicle	CNB	chloroacetophenone, benzene, and carbon tetrachloride	EBS	environmental baseline survey
AWARE	Associated Water and Air Resources Engineers, Inc.	CNS	chloroacetophenone, chloropicrin, and chloroform	EC <sub>50</sub>	effects concentration for 50 percent of a population
AWWSB	Anniston Water Works and Sewer Board	Co-60	cobalt-60	ECBC	Edgewood Chemical/Biological Command
‘B’	Analyte detected in laboratory or field blank at concentration greater than the reporting limit (and greater than zero)	CoA	Code of Alabama	EDQL	ecological data quality level
BCF	blank correction factor	COC	chain of custody; contaminant of concern	EE/CA	engineering evaluation and cost analysis
BCT	BRAC Cleanup Team	COE	Corps of Engineers	Elev.	elevation
BERA	baseline ecological risk assessment	Con	skin or eye contact	EM	electromagnetic
BEHP	bis(2-ethylhexyl)phthalate	COPC	contaminant of potential concern	EMI	Environmental Management Inc.
BFB	bromofluorobenzene	COPEC	contaminant of potential environmental concern	EM31	Geonics Limited EM31 Terrain Conductivity Meter
BFE	base flood elevation	CQCSM	Contract Quality Control System Manager	EM61	Geonics Limited EM61 High-Resolution Metal Detector
BG	Bacillus globigii	CRL	certified reporting limit	EOD	explosive ordnance disposal
bgs	below ground surface	CRZ	contamination reduction zone	EODT	explosive ordnance disposal team
BHC	betahexachlorocyclohexane	Cs-137	cesium-137	EPA	U.S. Environmental Protection Agency
bkg	background	CS	ortho-chlorobenzylidene-malononitrile	EPC	exposure point concentration
bls	below land surface	CSEM	conceptual site exposure model	EPIC	Environmental Photographic Interpretation Center
		ctr.	container	ER	equipment rinsate



**List of Abbreviations and Acronyms** *(Continued)*

ER-L	effects range-low
ER-M	effects range-medium
ESE	Environmental Science and Engineering, Inc.
ESN	Environmental Services Network, Inc.
ESV	ecological screening value
Exp.	explosives
E-W	east to west
EZ	exclusion zone
FAR	Federal Acquisition Regulations
FB	field blank
FD	field duplicate
FDA	U.S. Food and Drug Administration
FedEx	Federal Express, Inc.
FEMA	Federal Emergency Management Agency
FFE	field flame expedient
Fil	filtered
Flt	filtered
FMDC	Fort McClellan Development Commission
FML	flexible membrane liner
FMP 1300	Former Motor Pool 1300
FOMRA	Former Ordnance Motor Repair Area
Foster Wheeler	Foster Wheeler Environmental Corporation
Frtn	fraction
FS	field split; feasibility study
FSP	field sampling plan
ft	feet
ft/ft	feet per foot
FTA	Fire Training Area
FTMC	Fort McClellan
FTRRA	FTMC Reuse & Redevelopment Authority
g	gram
g/m <sup>3</sup>	gram per cubic meter
G-856	Geometrics, Inc. G-856 magnetometer
G-858G	Geometrics, Inc. G-858G magnetic gradiometer
gal	gallon
gal/min	gallons per minute
GB	sarin
gc	clay gravels; gravel-sand-clay mixtures
GC	gas chromatograph
GCL	geosynthetic clay liner
GC/MS	gas chromatograph/mass spectrometer
GCR	geosynthetic clay liner
GFAA	graphite furnace atomic absorption
GIS	Geographic Information System
gm	silty gravels; gravel-sand-silt mixtures
gp	poorly graded gravels; gravel-sand mixtures
gpm	gallons per minute
GPR	ground-penetrating radar

GPS	global positioning system
GS	ground scar
GSA	General Services Administration; Geologic Survey of Alabama
GSBP	Ground Scar Boiler Plant
GSSI	Geophysical Survey Systems, Inc.
GST	ground stain
GW	groundwater
gw	well-graded gravels; gravel-sand mixtures
HA	hand auger
HCl	hydrochloric acid
HD	distilled mustard
HDPE	high-density polyethylene
HEAST	Health Effects Assessment Summary Tables
Herb.	herbicides
HHRA	human health risk assessment
HI	hazard index
HNO <sub>3</sub>	nitric acid
HQ	hazard quotient
HQ <sub>screen</sub>	screening-level hazard quotient
hr	hour
H&S	health and safety
HSA	hollow-stem auger
HTRW	hazardous, toxic, and radioactive waste
‘I’	out of control, data rejected due to low recovery
ICAL	initial calibration
ICB	initial calibration blank
ICP	inductively-coupled plasma
ICRP	International Commission on Radiological Protection
ICS	interference check sample
ID	inside diameter
IDL	instrument detection limit
IDLH	immediately dangerous to life or health
IDM	investigative-derived media
IDW	investigation-derived waste
IEUBK	Integrated Exposure Uptake Biokinetic
ILCR	incremental lifetime cancer risk
IMPA	isopropylmethyl phosphonic acid
IMR	Iron Mountain Road
in.	inch
Ing	ingestion
Inh	inhalation
IP	ionization potential
IPS	International Pipe Standard
IRDMIS	Installation Restoration Data Management Information System
IRIS	Integrated Risk Information Service
IRP	Installation Restoration Program
ISCP	Installation Spill Contingency Plan
IT	IT Corporation

ITEMS	IT Environmental Management System <sup>TM</sup>
‘J’	estimated concentration
JeB2	Jefferson gravelly fine sandy loam, 2 to 6 percent slopes, eroded
JeC2	Jefferson gravelly fine sandy loam, 6 to 10 percent slopes, eroded
JfB	Jefferson stony fine sandy loam, 0 to 10 percent slopes have strong slopes
JPA	Joint Powers Authority
K	conductivity
K <sub>ow</sub>	octonal-water partition coefficient
L	lewisite; liter
LC <sub>50</sub>	lethal concentration for 50 percent of population tested
LD <sub>50</sub>	lethal dose for 50 percent of population tested
l	liter
LBP	lead-based paint
LCS	laboratory control sample
LC <sub>50</sub>	lethal concentration for 50 percent population tested
LD <sub>50</sub>	lethal dose for 50 percent population tested
LEL	lower explosive limit
LOAEL	lowest-observed-advserse-effects-level
LT	less than the certified reporting limit
LUC	land-use control
LUCAP	land-use control assurance plan
LUCIP	land-use control implementation plan
max	maximum
MCL	maximum contaminant level
MCPA	4-chloro-2-methylphenoxyacetic acid
MDC	maximum detected concentration
MDCC	maximum detected constituent concentration
MDL	method detection limit
mg	milligrams
mg/kg	milligrams per kilogram
mg/kg/day	milligram per kilogram per day
mg/kgbw/day	milligrams per kilogram of body weight per day
mg/L	milligrams per liter
mg/m <sup>3</sup>	milligrams per cubic meter
mh	inorganic silts, micaceous or diatomaceous fine, sandy or silt soils
MHz	megahertz
µg/g	micrograms per gram
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
µmhos/cm	micromhos per centimeter
min	minimum
MINICAMS	miniature continuous air monitoring system
ml	inorganic silts and very fine sands
mL	milliliter
mm	millimeter
MM	mounded material
MMBtu/hr	million Btu per hour
MOGAS	motor vehicle gasoline

**List of Abbreviations and Acronyms** (Continued)

MPA	methyl phosphonic acid	oh	organic clays of medium to high plasticity	RCRA	Resource Conservation and Recovery Act
MPM	most probable munition	ol	organic silts and organic silty clays of low plasticity	RD	remedial design
MR	molasses residue	OP	organophosphorus	RDX	cyclonite
MS	matrix spike	ORP	oxidation-reduction potential	RfD	reference dose
mS/cm	millisiemens per centimeter	OSHA	Occupational Safety and Health Administration	ReB3	Rarden silty clay loams
MSD	matrix spike duplicate	OSWER	Office of Solid Waste and Emergency Response	REG	regular field sample
MTBE	methyl tertiary butyl ether	OWS	oil/water separator	REL	recommended exposure limit
msl	mean sea level	oz	ounce	RFA	request for analysis
MtD3	Montevallo shaly, silty clay loam, 10 to 40 percent slopes , severely eroded	PA	preliminary assessment	RGO	remedial goal option
mV	millivolts	PAH	polynuclear aromatic hydrocarbon	RI	remedial investigation
MW	monitoring well	Parsons	Parsons Engineering Science, Inc.	RL	reporting limit
Na	sodium	Pb	lead	RPD	relative percent difference
NA	not applicable; not available	PCB	polychlorinated biphenyl	RRF	relative response factor
NAD	North American Datum	PCE	perchloroethene	RSD	relative standard deviation
NAD83	North American Datum of 1983	PCP	pentachlorophenol	RTECS	Registry of Toxic Effects of Chemical Substances
NAVD88	North American Vertical Datum of 1988	PDS	Personnel Decontamination Station	RTK	real-time kinematic
NAS	National Academy of Sciences	PEL	permissible exposure limit	SAD	South Atlantic Division
NCP	National Contingency Plan	PES	potential explosive site	SAE	Society of Automotive Engineers
ND	not detected	Pest.	pesticides	SAIC	Science Applications International Corporation
NE	no evidence; northeast	PETN	pentarey thritol tetranitrate	SAP	installation-wide sampling and analysis plan
ne	not evaluated	PFT	portable flamethrower	sc	clayey sands; sand-clay mixtures
NEW	net explosive weight	PG	professional geologist	Sch.	Schedule
NFA	No Further Action	PID	photoionization detector	SCM	site conceptual model
ng/L	nanograms per liter	PkA	Philo and Stendal soils local alluvium, 0 to 2 percent slopes	SD	sediment
NGVD	National Geodetic Vertical Datum	POL	petroleum, oils, and lubricants	SDG	sample delivery group
Ni	nickel	POW	prisoner of war	SDZ	safe distance zone; surface danger zone
NIC	notice of intended change	PP	peristaltic pump	SEMS	Southern Environmental Management & Specialties, Inc.
NIOSH	National Institute for Occupational Safety and Health	ppb	parts per billion	SFSP	site-specific field sampling plan
NLM	National Library of Medicine	PPE	personal protective equipment	SGF	standard grade fuels
NPDES	National Pollutant Discharge Elimination System	ppm	parts per million	SHP	installation-wide safety and health plan
NPW	net present worth	PPMP	Print Plant Motor Pool	SI	site investigation
No.	number	ppt	parts per thousand	SL	standing liquid
NOAA	National Oceanic and Atmospheric Administration	PR	potential risk	SLERA	screening-level ecological risk assessment
NOAEL	no-observed-adverse-effects-level	PRG	preliminary remediation goal	sm	silty sands; sand-silt mixtures
NR	not requested; not recorded; no risk	PSSC	potential site-specific chemical	SM	Serratia marcescens
NRC	National Research Council	pt	peat or other highly organic silts	SOP	standard operating procedure
NRCC	National Research Council of Canada	PVC	polyvinyl chloride	sp	poorly graded sands; gravelly sands
ns	nanosecond	QA	quality assurance	SP	submersible pump
N-S	north to south	QA/QC	quality assurance/quality control	SQRT	screening quick reference tables
NS	not surveyed	QAP	installation-wide quality assurance plan	Sr-90	strontium-90
nT	nanotesla	QC	quality control	SRA	streamlined human health risk assessment
NTU	nephelometric turbidity unit	QST	QST Environmental, Inc.	Ss	stony rough land, sandstone series
nv	not validated	qty	quantity	SS	surface soil
O&G	oil and grease	Qual	qualifier	SSC	site-specific chemical
O&M	operation and maintenance	‘R’	rejected data; resample	SSHO	site safety and health officer
OB/OD	open burning/open detonation	R&A	relevant and appropriate	SSHP	site-specific safety and health plan
OD	outside diameter	RAO	removal action objective	SSL	soil screening level
OE	ordnance and explosives	RBC	risk-based concentration	SSSL	site-specific screening level

**List of Abbreviations and Acronyms** (Continued)

SSSSL	site-specific soil screening level
STB	supertropical bleach
STC	source term concentration
STEL	short-term exposure limit
STOLS	Surface Towed Ordnance Locator System®
Std. units	standard units
SU	standard unit
SUXOS	senior UXO supervisor
SVOC	semivolatile organic compound
SW	surface water
SW-846	U.S. EPA’s <i>Test Methods for Evaluating Solid Waste: Physical/Chemical Methods</i>
SWPP	storm water pollution prevention plan
SZ	support zone
TAL	target analyte list
TAT	turn around time
TB	trip blank
TBC	to be considered
TCA	trichloroethane
TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin
TCDF	tetrachlorodibenzofurans
TCE	trichloroethene
TCL	target compound list
TCLP	toxicity characteristic leaching procedure
TDGCL	thiodiglycol
TDGCLA	thiodiglycol chloroacetic acid
TERC	Total Environmental Restoration Contract
TIC	tentatively identified compound
TLV	threshold limit value
TN	Tennessee
TNT	trinitrotoluene
TOC	top of casing; total organic carbon
TPH	total petroleum hydrocarbons
TRADOC	U.S. Army Training and Doctrine Command
TRPH	total recoverable petroleum hydrocarbons
TSCA	Toxic Substances Control Act
TSDF	treatment, storage, and disposal facility
TWA	time-weighted average
UCL	upper confidence limit
UCR	upper certified range
‘U’	not detected above reporting limit
USACE	U.S. Army Corps of Engineers
USACHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
USAEC	U.S. Army Environmental Center
USAEHA	U.S. Army Environmental Hygiene Agency
USACMLS	U.S. Army Chemical School
USAMPS	U.S. Army Military Police School
USATCES	U.S. Army Technical Center for Explosive Safety
USATEU	U.S. Army Technical Escort Unit

USATHAMA	U.S. Army Toxic and Hazardous Material Agency
USC	United States Code
USCS	Unified Soil Classification System
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
UST	underground storage tank
UTL	upper tolerance level
UXO	unexploded ordnance
UXOQCS	UXO Quality Control Supervisor
UXOSO	UXO safety officer
V	vanadium
VOA	volatile organic analyte
VOC	volatile organic compound
VOH	volatile organic hydrocarbon
VQlfr	validation qualifier
VQual	validation qualifier
VX	nerve agent (O-ethyl-S-[diisopropylaminoethyl]-methylphosphonothiolate)
Weston	Roy F. Weston, Inc.
WP	installation-wide work plan
WS	watershed
WSA	Watershed Screening Assessment
WWI	World War I
WWII	World War II
XRF	x-ray fluorescence
yd <sup>3</sup>	cubic yards

N – The high-spike recovery is low  
R – Data is rejected

SAIC – Data Qualifiers, Codes and Footnotes, 1995 Remedial Investigation

N/A – Not analyzed

ND – Not detected

Boolean Codes

LT – Less than the certified reporting limit

Flagging Codes

9 – Non-demonstrated/validated method performed for USAEC

B – Analyte found in the method blank or QC blank

C – Analysis was confirmed

D – Duplicate analysis

I – Interfaces in sample make quantitation and/or identification to be suspicious

J – Value is estimated

K – Reported results are affected by interfaces or high background

N – Tentatively identified compound (match greater than 70%)

Q – Sample interference obscured peak of interest

R – Non-target compound analyzed for but not detected (GC/MS methods)

S – Non-target compound analyzed for and detected (GC/MS methods)

T – Non-target compound analyzed for but not detected (non GC/MS methods)

U – Analysis in unconfirmed

Z – Non-target compound analyzed for and detected (non-GC/MS methods)

Qualifiers

J – The low-spike recovery is low



**Final  
Site-Specific Safety and Health Plan Attachment  
Site Investigation at Former Tank Ranges, Parcels 92Q-X and  
93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact  
Areas, Parcels 133Q-X and 134Q-X  
Fort McClellan  
Calhoun County, Alabama**

**Prepared for:**

**U.S. Army Corps of Engineers, Mobile District  
109 St. Joseph Street  
Mobile, Alabama 36602**

**Prepared by:**

**IT Corporation  
312 Directors Drive  
Knoxville, Tennessee 37923**

**Task Order CK10  
Contract No. DACA21-96-D-0018  
IT Project No. 796887**

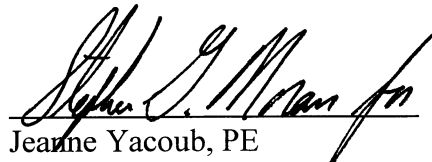
**January 2002**

The following Site-Specific Safety and Health Plan (SSHP) has been designed for the methods presently contemplated by IT Corporation (IT) for execution of the proposed work. Therefore, the SSHP may not be appropriate if the work is not performed by or using the methods presently contemplated by IT. In addition, as the work is performed, conditions different from those anticipated may be encountered and the SSHP may have to be modified. Therefore, IT only makes representations or warranties as to the adequacy of the SSHP for currently anticipated activities and conditions. This Site-Specific Safety and Health Plan must be used in conjunction with the Installation-Wide Safety and Health Plan and Installation-Wide Ordnance and Explosives Management Plan, Fort McClellan, Alabama.



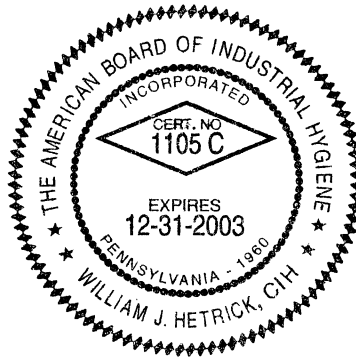
## Site-Specific Safety and Health Plan Attachment Approval Fort McClellan, Calhoun County, Alabama

I have read and approve this site-specific safety and health plan attachment for the site investigation at Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X, Fort McClellan, Alabama, with respect to project hazards, regulatory requirements, and IT Corporation procedures.

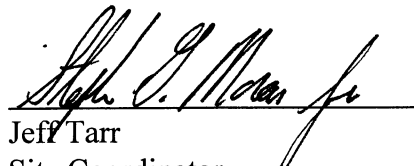
  
Jeanne Yacoub, PE  
Project Manager

1/15/02  
Date

  
William J. Hetrick  
Health & Safety Manager



1/15/02  
Date

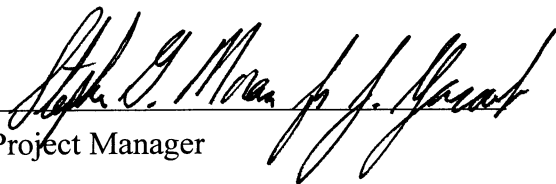
  
Jeff Tarr  
Site Coordinator

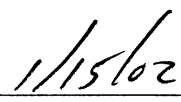
1/15/02  
Date

## Acknowledgements

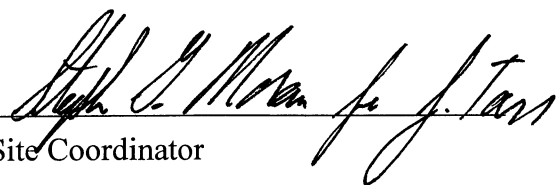
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The approved version of this site-specific safety and health plan (SSHP) attachment for the Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X, Fort McClellan, Alabama, has been provided to the site coordinator. I acknowledge my responsibility to provide the site coordinator with the equipment, materials, and qualified personnel to implement fully all safety requirements in this SSHP attachment. I will formally review this plan with the health and safety staff every 6 months until project completion.

  
Project Manager

  
Date

I acknowledge receipt of this SSHP attachment from the project manager, and that it is my responsibility to explain its contents to all site personnel and cause these requirements to be fully implemented. Any change in conditions, scope of work, or other change that might affect worker safety requires me to notify the project manager and the health and safety manager.

  
Site Coordinator

  
Date

I have been informed of, and will abide by, the procedures set forth in this site-specific safety and health plan attachment for site investigations associated with the Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X, Fort McClellan, Alabama.

**Date**This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

## Fort McClellan Gate Hours

Galloway Gate	Galloway Road. Open 6 am to 6 p.m. Monday through Friday
Baltzell Gate	Baltzell Road. Open 24 hours daily, 7 days a week.

## Fort McClellan Project Emergency Contacts

Range Control Office (Main Post) .....	(256) 848-6772
Fire Department (off post) .....	911
Ambulance (off post) .....	911
Northeast Regional Medical Center .....	(256) 235-5121
Military Police (SSG Busch) .....	(256) 848-5680, 848-4824
DOD Guard Force (Mr. Bolton) .....	(256) 848-5680, 848-4732
Anniston Police Department .....	(256) 238-1800
Chemical Agent Emergencies .....	(256) 895-1598
(Mike Smith, CEHNC) .....	cell phone (256) 759-3931
UXO Emergencies .....	(256) 895-1598
(Mike Smith, CEHNC) .....	cell phone (256) 759-3931
UXO Non emergencies/Reporting Only (Ronald Levy) .....	(256) 848-6853
Baltzell Gate Guard Shack .....	(256) 848-5693, 848-3821
National Response Center & Terrorist Hotline .....	(800) 424-8802
Poison Control Center .....	(800) 462-0800
EPA Region IV .....	(404) 562-8725
Ronald Levy, Chief, FTMC Environmental Management .....	(256) 848-6853
Ellis Pope, U.S. Army Corps of Engineers .....	(251) 690-3077
Jeanne Yacoub, IT Project Manager .....	(770) 663-1429
Bill Hetrick, IT H&S Manager .....	(865) 690-3211, and pager (888) 655-9529
Jeff Tarr, IT Site Manager .....	(256) 848-3482, 3499
Mike Moore, Fort McClellan Safety Office .....	(256) 848-5433
Dr. Jerry H. Berke, Health Resources Occupational Physician .....	(800) 350-4511



# Table of Contents

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	<i>Page</i>
List of Tables .....	ii
1.0 Site Work Plan Summary .....	1
2.0 Site Characterization and Analysis .....	3
2.1 Anticipated Hazards .....	3
2.2 General Site Information .....	3
3.0 Personal Protective Equipment .....	6
4.0 Site Monitoring .....	8
5.0 Activity Hazard Analysis .....	9

Attachment 1 – Evaluating OE/UXO/CWM in Support of HTRW Activities

## **List of Tables**

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<b>Table</b>	<b>Title</b>	<b>Follows Page</b>
2-1	Toxicological Properties of Chemicals	3
4-1	Action Levels	8
4-2	Air Monitoring Frequency and Location	8
5-1	Activity Hazard Analysis	9

## **List of Figures**

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<b>Figure</b>	<b>Title</b>	<b>Follows Page</b>
5-1	Hospital Emergency Route	9

## 1.0 Site Work Plan Summary

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**Project Objective.** The U.S. Army is conducting studies of the environmental impact of suspected contaminants at Fort McClellan (FTMC) in Calhoun County, Alabama, under the management of the U.S. Army Corps of Engineers (USACE)-Mobile District. The USACE has contracted IT Corporation (IT) to provide environmental services for the site investigation (SI) at the Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X, under Task Order CK10, Contract Number DACA21-96-D-0018.

The scope of work for activities associated with the SI at the Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X, includes the following tasks:

- Conduct a surface and near-surface unexploded ordnance (UXO) survey over all areas to be included in the sampling effort.
- Provide downhole UXO avoidance support for all drilling and intrusive sampling to determine buried downhole hazards.
- Collect surface soil, subsurface soil, groundwater, surface water, sediment and seep samples to determine if potential site-specific chemicals are present.
- Analyze samples for the parameters listed in the site-specific field sampling plan for each individual site of the investigation.

Attachment 1, Evaluating ordnance and explosive (OE)/UXO/chemical warfare material (CWM) Hazards in Support of hazardous, toxic, and radioactive waste (HTRW) Activities, confirms that the historical records available for the sites have been reviewed and that UXO support is required for all site activities. Additionally, based on all available information, it is anticipated that the potential for chemical warfare agents is low, and no real-time air monitoring for chemical warfare materials will be required.

UXO surface sweeps and downhole surveys of soil borings will be required to support field activities at this site. The surface sweeps and downhole surveys will be conducted to identify anomalies for the purpose of UXO avoidance. The site-specific UXO safety plan will be used to

support sample collection activities for this investigation, if incidental ordnance, explosives, or UXO are encountered and require avoidance.

At completion of the field activities and sample analysis, draft and final reports will be prepared to summarize the results of the activities, to evaluate the absence or presence of potential site-specific chemicals at this site, and to recommend further actions, if appropriate. The site investigation sampling reports will be prepared in accordance with current guidelines of the U.S. Environmental Protection Agency, Region IV, and the Alabama Department of Environmental Management.

***Personnel Requirements.*** Up to 15 employees are anticipated for this scope of work.

Note: All personnel on this site shall have received training, informational programs, and medical surveillance as outlined in the installation-wide safety and health plan for site investigations at FTMC and shall be familiar with the requirements of this site-specific safety and health plan (SSHP). This SSHP must be used in conjunction with the installation-wide safety and health plan and the installation-wide ordnance and explosives management plan.

## **2.0 Site Characterization and Analysis**

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### **2.1 Anticipated Hazards**

The activity hazard analysis in Chapter 5.0 contains project-specific practices utilized to reduce or eliminate anticipated site hazards. The activity hazard analysis indicates specific chemical and physical hazards that may be present and encountered during each task from on-site operations. Below each task is a list of hazards and specific actions that will be taken to control the respective hazards. These control measures may include work practice controls, engineering controls, and/or use of appropriate personal protective equipment (PPE). Site control with the use of specific work zones (support zone, contamination reduction zone, and exclusion zone) is addressed in Chapter 7.0 of Appendix A of the IT, August 2000, *Final Installation-Wide Sampling and Analysis Plan, Fort McClellan, Calhoun County, Alabama*.

A detailed description of each of the sites to be investigated can be found in the site-specific field sampling plan (SFSP) and should be reviewed to supplement this SSHP. Potential contaminant sources at the Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X, are primarily unknown, but may include nitroexplosives and metals. Lead in soil will be the metal most likely encountered, since live fire apparently occurred at the sites, based on previous field reconnaissance observations. Additional metals associated with the live fire of ammunition include arsenic, antimony, and barium. Engineering controls (dust suppression) will be required where site activities generate visible dust emissions from vehicle and equipment operations performed off established roadways and within the surface danger zone or firing direction and impact areas.

Procedures contained in the site-specific UXO safety plan shall be followed for all site activities associated with this investigation.

Table 2-1 contains the toxicological properties of chemicals anticipated or to be used at the Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X.

### **2.2 General Site Information**

**Location of Site.** FTMC is located in the foothills of the Appalachian Mountains of northeastern Alabama near the cities of Anniston and Weaver in Calhoun County. FTMC is



**Table 2-1**  
**Toxicological Properties of Chemicals**  
**Site Investigation at Former Tank Ranges, Parcels 92Q-X and**  
**93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact**  
**Areas, Parcels 133Q-X and 134Q-X**  
**Fort McClellan, Calhoun County, Alabama**

(Page 1 of 4)

Substance [CAS]	IP <sup>a</sup> (eV)	Odor Threshold (ppm)	Route <sup>b</sup>	Symptoms of Exposure	Treatment	TWA <sup>c</sup>	STEL <sup>d</sup>	Source <sup>e</sup>	IDLH (NIOSH) <sup>f</sup>
Arsenic [7440-38-2]	NA	NA	Inh Ing Con	Cough, diarrhea, shortness of breath, vomiting, grey skin. Redness	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	0.01 mg/m <sup>3</sup> 0.01 mg/m <sup>3</sup>	(Ca) 0.002 mg/m <sup>3</sup>	PEL TLV REL	5 mg/m <sup>3</sup>
Antimony [7440-36-0]	NA	NA	Inh Ing Con	Coughing, abdominal pain, burning sensation, vomiting, diarrhea,	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support allow : Immediate medical attention	0.5 mg/m <sup>3</sup> 0.5 mg/m <sup>3</sup> 0.5 mg/m <sup>3</sup>		PEL TLV REL	50 mg/m <sup>3</sup>
Barium [7440-39-3]	NA	NA	Inh Ing Con	Cough, sore throat  Redness	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	0.5 mg/m <sup>3</sup> 0.5 mg/m <sup>3</sup> 0.5 mg/m <sup>3</sup>		PEL TLV REL	NA
Fuel oil (diesel oil, medium)	?	?	Ing Inh Con	Ingestion causes nausea, vomiting, and cramps; depressed central nervous system, headache, coma, death; pulmonary irri- tation; kidney and liver damage; aspiration causes severe lung irritation, coughing, gagging, dyspnea, substernal stress, pulmonary edema; bronchopneumonia; excited, then depressed, central nervous system.	Eye: Irrigate promptly Skin: Soap wash Breath: Respiratory support Swallow: Immediate medical attention Aspiration: Immediate medical attention			PEL TLV REL	

**Table 2-1**

**Toxicological Properties of Chemicals**

**Site Investigation at Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X**

**Fort McClellan, Calhoun County, Alabama**

(Page 2 of 4)

Substance [CAS]	IP <sup>a</sup> (eV)	Odor Threshold (ppm)	Route <sup>b</sup>	Symptoms of Exposure	Treatment	TWA <sup>c</sup>	STEL <sup>d</sup>	Source <sup>e</sup>	IDLH (NIOSH) <sup>f</sup>
Gasoline [8006-61-9]	?	0.3	Inh Ing Con	Intoxication, headaches, blurred vision, dizziness, nausea; eye, nose throat irritation; potential kidney and other cancers. Carcinogenic.	Eye: Irrigate immediately (15 min) Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	300 ppm 300 ppm Ca, lowest feasible conc. (LOQ 15 ppm)	500 ppm 500 ppm	PEL TLV REL	1400 ppm (10% LEL)
Lead [7439-92-1]	N/A	N/A	Inh Ing Con	Lightheadedness; nausea, headache; numbness of the extremities, muscular weakness; irritation of the eyes and nose; dermatitis; chemical pneumonia; giddiness.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	0.050 mg/m <sup>3</sup> 0.050 mg/m <sup>3</sup> 0.100 mg/m <sup>3</sup>		PEL TLV REL	100 mg/m <sup>3</sup>
Isopropyl alcohol (isopropanol) [67-63-0]	10.16	43□200	Inh Ing Con	Mild irritation of the eyes, nose, and throat; drowsiness, dizziness, headache; dry, cracked skin.	Eye: Irrigate immediately Skin: Water flush Breath: Respiratory support Swallow: Immediate medical attention	400 ppm 400 ppm 400 ppm	500 ppm 500 ppm 500 ppm	PEL TLV REL	2,000 ppm
Motor Oil [NA]	?	?	Inh Ing	Irritated eyes, skin, respiratory system; usually only a problem if misted or ingested.	Eye: Irrigate immediately (15 min) Skin: Soap wash immediately Swallow: Immediate medical attention			PEL TLV REL	

**Table 2-1**

**Toxicological Properties of Chemicals**

**Site Investigation at Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X**

**Fort McClellan, Calhoun County, Alabama**

(Page 3 of 4)

Substance [CAS]	IP <sup>a</sup> (eV)	Odor Threshold (ppm)	Route <sup>b</sup>	Symptoms of Exposure	Treatment	TWA <sup>c</sup>	STEL <sup>d</sup>	Source <sup>e</sup>	IDLH (NIOSH) <sup>f</sup>
Nitric acid [7697-37-2]	11.95	0.3-1	Inh Ing Con	Irritated eyes, mucous membranes, and skin; delayed pulmonary edema, pneumonitis, bronchitis; dental erosion.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Respiratory support Swallow: Immediate medical attention	2 ppm 2 ppm 2 ppm	4 ppm 4 ppm 4 ppm	PEL TLV REL	25ppm
Nitroglycerin [55-63-0]	NA	NA	Inh Ing Con	Abdominal ramps, blue lips and fingernails, dizziness, headache, labored breathing	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	skin 2 mg/m <sup>3</sup> 0.46 mg/m <sup>3</sup> skin	0.1 mg/m <sup>3</sup> skin	PEL TLV REL	75 mg/m <sup>3</sup>
Portland cement [ 65997-15-1 ]	NA	NA	Inh	Fine gray powder that can be irritating if inhaled or in eyes.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	5 mg/m <sup>3</sup> respirable fraction 15 mg/m <sup>3</sup> total dust 10 mg/m <sup>3</sup> 10 mg/m <sup>3</sup> /total dust		PEL  TLV REL	5000 mg/m <sup>3</sup>
Sodium hydroxide [1310-73-2]	NA	NA	Inh Ing Con	Irritated nose; pneumonitis; burns eyes, and skin; temporary loss of hair.	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention	2 mg/m <sup>3</sup> C 2 mg/m <sup>3</sup> C 2 mg/m <sup>3</sup>		PEL TLV REL	10 mg/m <sup>3</sup>

NOTE: Additional chemical safety information for arsenic, lead, antimony, barium and nitroglycerin follows Table 2-1.

<sup>a</sup>IP = Ionization potential (electron volts).

<sup>b</sup>Route = Inh, Inhalation; Abs, Skin absorption; Ing, Ingestion; Con, Skin and/or eye contact.

<sup>c</sup>TWA = Time-weighted average. The TWA concentration for a normal work day (usually 8 or 10 hours) and a 40-hour work week, to which nearly all workers may be repeatedly exposed, day after day without adverse effect.

<sup>d</sup>STEL = Short-term exposure limit. A 15-minute TWA exposure that should not be exceeded at any time during a workday, even if the TWA is not exceeded.

<sup>e</sup>PEL = Occupational Safety and Health Administration (OSHA) permissible exposure limit (29 CFR 1910.1000, Table Z).

AEL = Airborne Exposure Limit.

TLV = American Conference of Governmental Industrial Hygiene (ACGIH) threshold limit value-TWA.

REL = National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit.

<sup>f</sup>IDLH (NIOSH) Immediately dangerous to life or health (NIOSH). Represents the maximum concentration from which, in the event of respirator failure, one could escape within 30 minutes without a respirator and without experiencing any escape-impairing or irreversible health effects.

NE = No evidence could be found for the existence of an IDLH (NIOSH Pocket Guide to Chemical Hazards, Pub. 1998).

C = Ceiling limit value which should not be exceeded at any time.

Ca = Carcinogen.

NA = Not applicable.

? = Unknown.

LEL = Lower explosive limits.

LC<sub>50</sub> = Lethal concentration for 50 percent of population tested.

LD<sub>50</sub> = Lethal dose for 50 percent of population tested.

NIC = Notice of intended change (ACGIH).

**Table 2-1**

**Toxicological Properties of Chemicals**  
**Site Investigation at Former Tank Ranges, Parcels 92Q-X and**  
**93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact**  
**Areas, Parcels 133Q-X and 134Q-X**  
**Fort McClellan, Calhoun County, Alabama**

(Page 4 of 4)

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Amoore, J. E. Hautula, "Odor as an Aid to Chemical Safety," Journal of Applied Toxicology, 1983.

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Micromedex Tomes Plus (R) System, 1992, Micromedex, Inc.

National Institute for Occupational Safety and Health Pocket Guide to Chemicals, Pub. 1998, National Institute for Occupational Safety and Health.

Odor Threshold for Chemicals with Established Occupational Health Standards, American Industrial Hygiene Association, 1989.

Respirator Selection Guide, 3M Occupational Health and Safety Division, 1993.

Verschueren, K., Handbook of Environmental Data on Organic Chemicals, Van Nostrand and Reinhold, 1977.

Warning Properties of Industrial Chemicals Occupational Health Resource Center, Oregon Lung Association.

Workplace Environmental Exposure Levels, American Industrial Hygiene Association, 1992.

approximately 60 miles northeast of Birmingham, 75 miles northwest of Auburn, and 95 miles west of Atlanta, Georgia. FTMC consists of three main areas of government-owned and leased properties: Main Post, Pelham Range, and Choccolocco Corridor (lease terminated in May 1998).

Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X, are located in the northern area of FTMC. The area for this site investigation is 123 acres.

***Duration of Planned Employee Activity.*** Employee activity duration is anticipated to be less than two months.

### ***Site Descriptions***

***Former Tank Ranges, Parcels 92Q-X and 93Q-X.*** Parcels 92Q-X and 93Q-X are identified as two former tank ranges and appear on historical maps of FTMC from 1956 and 1959. Parcel 92Q-X is located south of Falcon Road and extends to the southeast toward Mout Road. Syracuse Street spans the length of the parcel near its western border. Parcel 93Q-X is located just west of Parcel 92Q-X. The exact size and type of ordnance fired at these parcels and the dates of use are unknown.

***Former Grenade Range, Parcel 107Q-X.*** Parcel 107Q-X is identified as a former grenade range. Exact dates of use and exact size of the range are unknown. The range fan extends toward the southeast; therefore, direction of fire is suspected to have been to the southeast. The range fan encompasses Parcels 93Q-X, 133Q-X, and 134Q-X in their entirety and extends beyond this SI study area. The range fan almost completely covers Parcel 92Q-X. The exact types of ordnance used are unknown; however, based on the title of the range (Former Grenade Range), it is assumed that grenades were used here.

***Impact Areas, Parcels 133Q-X and 134Q-X.*** Parcels 133Q-X and 134Q-X are identified in the environmental baseline survey as impact areas. Parcel 133Q-X is located within the range fan of Parcel 93Q-X. Parcel 134Q-X is located just to the east of the impact area of Parcel 92Q-X.

***Pathways for Hazardous Substance Dispersion.*** Possible pathways for hazardous substances in the area are soils, sediments, surface water and groundwater.



### 3.0 Personal Protective Equipment

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The work activities will begin in the following levels of protection. Also, a complete description of Level D, Modified Level D, and Level C PPE is provided.

Task	Initial Level of PPE
Initial UXO avoidance sweep and equipment staging	Level D
Utility clearance	Level D
Surface water, sediment and surface soil sampling	Level D
Subsurface soil and groundwater sampling	Modified Level D*
Monitoring well installation and dowlhole UXO avoidance	Modified Level D*
Surveying	Level D

\*Initial level will be raised to Level C or higher if air monitoring results in the breathing zone (BZ) are greater than action levels.

**Level D.** The minimal level of protection that will be required of IT personnel at the site will be Level D. The following equipment will be used for Level D protection:

- Coveralls or work clothing
- Leather work gloves (when necessary)
- Steel-toed safety boots
- Safety glasses
- Hardhat
- Hearing protection (when working near/adjacent to operating equipment).

**Modified Level D.** The following equipment will be used for Level D-Modified protection:

- Permeable Tyvek, Kleenguard, or its equivalent
- Latex boot covers

- Nitrile, heavy work, or latex gloves
- Steel-toed safety boots
- Safety glasses
- Hardhat
- Hearing protection (when working near/adjacent to operating equipment).

Note: In addition to Modified Level D PPE, the operator of high-pressure water jetting equipment (pressure washers) shall wear metatarsal guards for protection of the legs and feet and a face shield for protection from splashes.

**Level C.** Level C protection will not be used unless air-monitoring data indicate the need for upgrade; however, the equipment shall be readily available on site. The following equipment will be used for Level C protection:

- National Institute of Occupational Safety and Health/Mine Safety and Health Administration-approved full-face, air-purifying respirator equipped with organic vapor/acid gas cartridge in combination with high-efficiency particulate air filter
- Hooded, Saran-coated Tyvek, taped at gloves, boots, and respirator
- Nitrile gloves (outer)
- Latex or lightweight nitrile gloves (inner)
- Neoprene steel-toed boots or polyvinyl chloride overbooties/steel-toed safety boots
- Hardhat
- Hearing protection (when working near/adjacent to operating equipment).

Note: In addition to Level C PPE, the operator of high-pressure water jetting equipment (pressure washers), shall wear metatarsal guards for protection of the legs and feet.

## 4.0 Site Monitoring

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The environmental contaminants of concern resulting from former activities on the Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X, are primarily unknown but, based on land-use history, probably include nitroexplosives and metals.

Table 4-1 contains action levels for site monitoring on the Former Tank Ranges, Former Grenade Range, and Impact Areas.

**Chemical.** The site safety and health officer or task geologist shall perform air monitoring during the performance of site activities and ground-intrusive operations. A calibrated photo ionization detector (e.g., Hnu DL-101 or equivalent) organic vapor analyzer will be used to monitor the sampling locations and BZs to determine if any organic material may be present that would necessitate upgrading of the protection level. A calibrated combustible gas/oxygen indicator will be utilized to monitor the borehole, work areas, and BZs to determine if any combustible/flammable levels may be present that would necessitate evacuation of the work area. A Miniram PDM-3 or equivalent aerosol monitor shall be used to monitor airborne dust, since lead is a potential concern. Table 4-2 contains the air monitoring frequency and location for the site investigations.

**Unexploded Ordnance.** UXO support for sampling activities is specified in the site-specific UXO safety plan for the site investigations. The UXO specialists will perform UXO avoidance sweeps prior to moving the heavy equipment onto the site. During this operation, UXO on the surface and in the shallow subsurface will be detected and marked for avoidance during field operations. Additionally, downhole magnetometer surveys will be performed to detect metal objects in the path of the sampling equipment or boring apparatus. The sampling/boring location will be moved to avoid subsurface metal objects. The practice of UXO avoidance shall be implemented for all intrusive activities.

If UXO is encountered, personnel will contact the site manager and UXO specialist immediately. Personnel will evacuate the immediate area and secure it.

**Table 4-1**

**Action Levels**  
**Site Investigation at Former Tank Ranges, Parcels 92Q-X and**  
**93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact**  
**Areas, Parcels 133Q-X and 134Q-X**  
**Fort McClellan, Calhoun County, Alabama**

(Page 1 of 2)

When in Level C PPE

Analyte	Action Level	Required Action <sup>a</sup>
VOCs (volatile organic compound)	$\geq 10$ ppm above background in breathing zone (BZ)	Stop work, evacuate work area, upgrade to Level B; Notify CIH
Dust	$> 5.0$ mg/m <sup>3</sup> above background in BZ	Normal operations, initiate dust control to minimize migration.
LEL (lower explosive limit)	$\leq 10$ % LEL $\geq 10$ % LEL	Normal operations Stop work, identify source

When in Level D Modified/D PPE

Analyte	Action Level	Required Action <sup>b</sup>
VOCs	$\geq 1$ ppm above background in BZ	Stop activities, suspend work activities for 15 to 30 minutes, if readings are sustained then upgrade to Level C PPE; Notify CIH
Dust	$\geq 2.5$ mg/m <sup>3</sup> above background in BZ	Stop work, Initiate dust control, upgrade to Level C PPE if dust control is not effective; Notify CIH
LEL (lower explosive limit)	$\leq 10$ % LEL $\geq 10$ % LEL	Normal operations Stop work, identify source. Monitor for VOCs

**Table 4-1**

**Action Levels**  
**Site Investigation at Former Tank Ranges, Parcels 92Q-X and**  
**93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact**  
**Areas, Parcels 133Q-X and 134Q-X**  
**Fort McClellan, Calhoun County, Alabama**

(Page 2 of 2)

When in Support Zone

Analyte	Action Level	Required Action
VOCs	$\geq 1$ ppm above background in BZ	Evacuate support zone and re-establish perimeter of exclusion zone.
Dust	$> 0.5$ mg/m <sup>3</sup> above background in BZ	Stop work, Initiate dust control

<sup>a</sup> Four instantaneous peaks in any 15-minute period or a sustained reading for 5 minutes in excess of the action level will trigger a response.

<sup>b</sup> Contact with the H&S manager must be made prior to continuance of work. The H&S manager may then initiate perimeter/integrated air sampling along with additional engineering controls.

**No one is permitted to downgrade levels of PPE without authorization from the H&S manager.**

BZ – Breathing zone.

CIH – Certified industrial hygienist.

LEL – Lower explosive limit.

mg/m<sup>3</sup> – Milligrams per cubic meter.

PPE – Personal protective equipment.

ppm – Parts per million.

VOC – Volatile organic compound.

**Table 4-2**

**Air Monitoring Frequency and Location  
Site Investigation at Former Tank Ranges, Parcels 92Q-X and  
93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact  
Areas, Parcels 133Q-X and 134Q-X  
Fort McClellan, Calhoun County, Alabama**

Work Activity	Instrument	Frequency	Location
Staging equipment and UXO avoidance sweeps	OV Monitor Miniram	Initially for area Periodically	Breathing zone (BZ) of employees
Sampling (surface water, surface soil, sediment, and seeps)	OV Monitor Miniram	Periodically Periodically	BZ of employees BZ of employees
Monitoring well installation and subsurface soil sampling	OV Monitor Miniram LEL/ O <sub>2</sub>	Periodically Periodically Periodically	BZ of employees BZ of employees Bore hole

OV = Organic vapor.

Miniram = Aerosol (dust) monitor

LEL/O<sub>2</sub> = Lower explosive limit/oxygen level



## **5.0 Activity Hazard Analysis**

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The attached activity hazard analysis (Table 5-1) is provided for the following activities:

- Initial UXO avoidance sweep and equipment staging
- Installation of monitoring wells
- Surface water, sediment, surface soil and seep sampling
- Groundwater sampling
- Surveying
- Moving and shipping collected samples
- Disposal of investigative derived waste (forklift operations)
- High-pressure water jetting operations
- Material storage.

All injuries and illnesses must be immediately reported to the site manager or the site safety and health officer, who will then notify off-site personnel and organizations as necessary.

If hospital care must be provided, the victim shall be treated at Northeast Regional Medical Center. Directions to the hospital for the SI are provided in Figure 5-1.

**Table 5-1**

**Activity Hazard Analysis  
Site Investigation at Former Tank Ranges, Parcels 92Q-X and  
93Q-X, Former Grenade Range, Parcel 107Q-X and Impact  
Areas, Parcels 133Q-X and 134Q-X  
Fort McClellan, Calhoun County, Alabama**

(Page 1 of 14)

Activity	Potential Hazards	Recommended Controls
Initial UXO avoidance sweep and equipment staging	Slip, trip, and fall hazards	<ul style="list-style-type: none"> <li>Determine best access route before transporting equipment.</li> <li>Practice good housekeeping; keep work area picked up and clean as feasible.</li> <li>Continually inspect the work area for slip, trip, and fall hazards.</li> <li>Look before you step; ensure safe and secure footing.</li> </ul>
	Heavy lifting	<ul style="list-style-type: none"> <li>Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment.</li> </ul>
	Falling objects	<ul style="list-style-type: none"> <li>Stay alert and clear of materials suspended overhead; wear hard hat and steel-toed boots.</li> </ul>
	Flying debris, dirt, dust, etc.	<ul style="list-style-type: none"> <li>Wear safety glasses/goggles; ensure that eye wash is in proper working condition.</li> </ul>
	Pinch points	<ul style="list-style-type: none"> <li>Keep hands, fingers, and feet clear of moving/suspended materials and equipment.</li> <li>Beware of contact points.</li> <li>Stay alert at all times!</li> </ul>
	Cuts/bruises	<ul style="list-style-type: none"> <li>Use cotton or leather work gloves for material handling.</li> </ul>
	Bees, spiders, and snakes	<ul style="list-style-type: none"> <li>Inspect work area carefully and avoid placing hands and feet into concealed areas.</li> </ul>
	Ticks	<ul style="list-style-type: none"> <li>Wear light colored clothing (can see ticks better).</li> <li>Mow vegetated and small brush areas.</li> <li>Wear insect repellent.</li> <li>Wear long sleeves and long pants.</li> <li>Visually check oneself promptly and frequently after exiting the work area.</li> </ul>
	Fire	<ul style="list-style-type: none"> <li>Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.</li> </ul>
	Hazard communication	<ul style="list-style-type: none"> <li>Label all containers as to contents and dispose of properly.</li> <li>Ensure Material Safety Data Sheets (MSDS) are available for hazardous chemicals used on site.</li> </ul>
	Noise	<ul style="list-style-type: none"> <li>Sound levels above 85 decibels (dBA) mandates hearing protection.</li> </ul>
	Lighting	<ul style="list-style-type: none"> <li>Adequate lighting will be provided to ensure a safe working environment.</li> </ul>

**Table 5-1**

**Activity Hazard Analysis  
Site Investigation at Former Tank Ranges, Parcels 92Q-X and  
93Q-X, Former Grenade Range, Parcel 107Q-X and Impact  
Areas, Parcels 133Q-X and 134Q-X  
Fort McClellan, Calhoun County, Alabama**

(Page 2 of 14)

Activity	Potential Hazards	Recommended Controls
Initial UXO avoidance sweep and equipment staging (continued)	Cold stress	<ul style="list-style-type: none"> <li>Workers should wear insulated clothing when temperatures drop below 40 degrees Fahrenheit (°F).</li> <li>Drink warm beverages on breaks. Refrain from drinking caffeinated beverages.</li> <li>Remove wet clothing promptly.</li> <li>Take breaks in warm areas.</li> <li>Reduce work periods as necessary.</li> <li>Layer work clothing.</li> </ul>
	Poison ivy/oak/sumac	<ul style="list-style-type: none"> <li>Avoid plant areas if possible.</li> <li>Wear long sleeves and long pants.</li> <li>Promptly wash clothing that has contacted poisonous plants.</li> <li>Wash affected areas immediately with soap and water.</li> </ul>
	Heat rash	<ul style="list-style-type: none"> <li>Keep the skin clean and dry.</li> <li>Change perspiration-soaked clothing, as necessary.</li> <li>Bathe at end of work shift or day.</li> <li>Apply powder to affected area.</li> </ul>
	Heat cramps	<ul style="list-style-type: none"> <li>Drink plenty of cool fluids even when not thirsty.</li> <li>Provide cool fluid for work crews.</li> <li>Move victim to shaded, cool area.</li> </ul>
	Heat exhaustion	<ul style="list-style-type: none"> <li>Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature).</li> <li>Set up work/rest periods.</li> <li>Use the "buddy system."</li> <li>Allow workers time to acclimate.</li> <li>Have ice packs available for use.</li> <li>Take frequent breaks.</li> </ul>

**Table 5-1**

**Activity Hazard Analysis  
Site Investigation at Former Tank Ranges, Parcels 92Q-X and  
93Q-X, Former Grenade Range, Parcel 107Q-X and Impact  
Areas, Parcels 133Q-X and 134Q-X  
Fort McClellan, Calhoun County, Alabama**

(Page 3 of 14)

Activity	Potential Hazards	Recommended Controls
Initial UXO avoidance sweep and equipment staging (continued)	Heat stroke	<ul style="list-style-type: none"><li>• Evaluate possibility of night work.</li><li>• Perform physiological monitoring on workers during breaks.</li><li>• Wear body cooling devices.</li></ul>
	Contact with moving equipment/vehicles	<ul style="list-style-type: none"><li>• Work area will be barricaded/demarcated.</li><li>• Equipment will be laid out in an area free of traffic flow.</li><li>• Barricades shall be used on or around work areas when it is necessary to prevent the inadvertent intrusion of pedestrian traffic.</li><li>• Barriers shall be used to protect workers from vehicular traffic.</li><li>• Barriers shall be used to guard excavations adjacent to streets or roadways.</li><li>• Flagging shall be used for the short term (less than 24 hours) to identify hazards until proper barricades or barriers are provided.</li><li>• Heavy equipment shall have backup alarms.</li></ul>
	Forklift operations	<ul style="list-style-type: none"><li>• Use qualified and trained forklift operators.</li><li>• The operator shall not exceed the load capacity rating for the forklift.</li><li>• The load capacity shall be clearly visible on the forklift.</li><li>• Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement.</li></ul>
	Portable electric tools	<ul style="list-style-type: none"><li>• Portable electric tools that are unsafe due to faulty plugs, damaged cords, or other reasons, shall be tagged (do not use) and removed from service.</li><li>• Portable electric tools and all cord and plug connected equipment shall be protected by a ground-fault circuit interrupter (GFCI) device.</li><li>• Electrical tools shall be inspected daily prior to use.</li></ul>

**Table 5-1**

**Activity Hazard Analysis  
Site Investigation at Former Tank Ranges, Parcels 92Q-X and  
93Q-X, Former Grenade Range, Parcel 107Q-X and Impact  
Areas, Parcels 133Q-X and 134Q-X  
Fort McClellan, Calhoun County, Alabama**

(Page 4 of 14)

Activity	Potential Hazards	Recommended Controls
Initial UXO avoidance sweep and equipment staging (continued)	Extension cords	<ul style="list-style-type: none"> <li>• Extension cords that have faulty plugs, damaged insulation, or are unsafe in any way shall be removed from service.</li> <li>• Cords shall be protected from damage from sharp edges, projections, pinch points (doorways), and vehicular traffic.</li> <li>• Cords shall be suspended with a nonconductive support (rope, plastic ties, etc.).</li> <li>• Cords shall be designed for hard duty.</li> <li>• Cords shall be inspected daily.</li> </ul>
	Lightning strikes	<ul style="list-style-type: none"> <li>• Whenever possible, halt activities and take cover.</li> <li>• If outdoors, get away from elevated locations (i.e., roofs, ladders, equipment).</li> <li>• Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground).</li> <li>• Seek shelter in a building if possible.</li> <li>• Stay away from windows.</li> <li>• If available, crouch under a group of trees instead of one.</li> <li>• Remain 6 feet away from tree trunk if seeking shelter beneath tree(s).</li> <li>• If in a group, keep 6 feet of distance between people.</li> </ul>
	Thunderstorms, tornados	<ul style="list-style-type: none"> <li>• Listen to radio or TV announcements for pending weather information.</li> <li>• Cease field activities during thunderstorm or tornado warnings.</li> <li>• Seek shelter. Do not try to outrun a tornado.</li> </ul>
Surveying	Slip, trip, and fall hazards	<ul style="list-style-type: none"> <li>• Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe boots when working in the field.</li> <li>• Provide adequate lighting in all work areas.</li> <li>• Whenever possible, avoid routing cords and hoses across walking pathways.</li> <li>• Flag or cover inconspicuous holes to protect against falls.</li> <li>• Work areas will be kept clean and orderly.</li> <li>• Garbage and trash will be disposed of daily in approved refuse containers.</li> <li>• Tools and accessories will be properly maintained and stored.</li> <li>• Work areas and floors will be kept free of dirt, grease, and slippery materials.</li> </ul>

**Table 5-1**

**Activity Hazard Analysis  
Site Investigation at Former Tank Ranges, Parcels 92Q-X and  
93Q-X, Former Grenade Range, Parcel 107Q-X and Impact  
Areas, Parcels 133Q-X and 134Q-X  
Fort McClellan, Calhoun County, Alabama**

(Page 5 of 14)

Activity	Potential Hazards	Recommended Controls
Surveying (continued)	Traffic accidents	<ul style="list-style-type: none"><li>• Place physical barrier (i.e., barricades, fencing) around work areas regularly occupied by pedestrians.</li><li>• If working adjacent to roadways, have workers wear fluorescent orange vests.</li><li>• Use warning signs or lights to alert oncoming traffic.</li><li>• Assign flag person(s) if necessary to direct local traffic.</li><li>• Set up temporary parking locations outside the immediate work area.</li><li>• Motor vehicle operators shall obey all posted traffic signs, signals, and speed limits.</li><li>• Pedestrians have the right-of-way.</li><li>• Wear seat belts when vehicles are in motion.</li></ul>
	Wildlife hazards	<ul style="list-style-type: none"><li>• Workers should be cautious when driving through the site in order to avoid encounters with passing animals.</li></ul>
	Biological hazards	<ul style="list-style-type: none"><li>• Walking through overgrown grass areas, watch for snakes (rattlesnakes, moccasins, copperheads).</li></ul>
	Ticks	<ul style="list-style-type: none"><li>• Wear light colored clothing (makes ticks more visible).</li><li>• Mow vegetated and small brush areas.</li><li>• Wear insect repellent.</li><li>• Wear long sleeves and long pants.</li><li>• Visually check oneself promptly and frequently after exiting the work area.</li></ul>
	Poison ivy/oak/sumac	<ul style="list-style-type: none"><li>• Avoid plant areas if possible.</li><li>• Wear long sleeves and long pants.</li><li>• Promptly wash clothing that has contacted poisonous plants.</li><li>• Wash affected areas immediately with soap and water.</li></ul>
	UXO	<ul style="list-style-type: none"><li>• UXO avoidance monitoring will be conducted by a UXO specialist prior to beginning activities.</li><li>• If UXO is encountered, cease all activities, mark the location, and notify the site manager.</li></ul>



**Table 5-1**

**Activity Hazard Analysis  
Site Investigation at Former Tank Ranges, Parcels 92Q-X and  
93Q-X, Former Grenade Range, Parcel 107Q-X and Impact  
Areas, Parcels 133Q-X and 134Q-X  
Fort McClellan, Calhoun County, Alabama**

(Page 6 of 14)

Activity	Potential Hazards	Recommended Controls
Groundwater Sampling	Cross-contamination and contact with potentially contaminated materials	<ul style="list-style-type: none"><li>• Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination.</li><li>• Avoid skin contact with water.</li><li>• Handle samples with care.</li><li>• Only essential personnel will be in the work area.</li><li>• Real-time air monitoring will take place before and during sampling activities.</li><li>• All personnel will follow good hygiene practices.</li><li>• Proper decontamination procedures will be followed.</li><li>• All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.</li></ul>
	Cut hazards	<ul style="list-style-type: none"><li>• Use care when handling glassware.</li><li>• Wear adequate hand protection.</li></ul>
	Hazard communication	<ul style="list-style-type: none"><li>• MSDSs shall be obtained for chemicals brought on site.</li><li>• Label all containers as to contents.</li></ul>
	Strains/sprains	<ul style="list-style-type: none"><li>• Use the proper tool for the job being performed.</li><li>• Get assistance if needed.</li><li>• Avoid twisting/turning while pulling on tools, moving equipment, etc.</li></ul>
	Spills/residual materials	<ul style="list-style-type: none"><li>• Absorbent material and containers will be kept available where leaks or spills may occur.</li></ul>
	Lighting	<ul style="list-style-type: none"><li>• Adequate lighting will be provided to ensure a safe working environment.</li></ul>
	Unattended worker	<ul style="list-style-type: none"><li>• Use "buddy system" - visual contact will be maintained with the sampling technician during sampling activities.</li></ul>

**Table 5-1**

**Activity Hazard Analysis  
Site Investigation at Former Tank Ranges, Parcels 92Q-X and  
93Q-X, Former Grenade Range, Parcel 107Q-X and Impact  
Areas, Parcels 133Q-X and 134Q-X  
Fort McClellan, Calhoun County, Alabama**

(Page 7 of 14)

Activity	Potential Hazards	Recommended Controls
Surface water, sediment, surface soil and seep sampling	Cross-contamination and contact with potentially contaminated materials	<ul style="list-style-type: none"> <li>• Stop immediately at any sign of obstruction.</li> <li>• Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination.</li> <li>• Only essential personnel will be in the work area.</li> <li>• Real-time air monitoring will take place before and during sampling activities.</li> <li>• All personnel will follow good hygiene practices.</li> <li>• Proper decontamination procedures will be followed.</li> <li>• All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.</li> </ul>
	Cut hazards	<ul style="list-style-type: none"> <li>• Use care when handling glassware.</li> <li>• Wear adequate hand protection.</li> </ul>
	Slip, trip, and fall hazards	<ul style="list-style-type: none"> <li>• Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe/shank boots when working in the field.</li> <li>• Whenever possible, avoid routing cords and hoses across walking pathways.</li> <li>• Flag or cover inconspicuous holes to protect against falls.</li> </ul>
	Bees, spiders, and snakes	<ul style="list-style-type: none"> <li>• Workers shall inspect the work area carefully and avoid placing hands and feet into concealed areas.</li> <li>• Evaluate need for sensitive workers to have prescribed antibiotic or medicine to combat onset of symptoms.</li> </ul>
	Poison ivy/oak/sumac	<ul style="list-style-type: none"> <li>• Avoid plant areas if possible.</li> <li>• Wear long sleeves and long pants.</li> <li>• Promptly wash clothing that has contacted poisonous plants.</li> <li>• Wash affected areas immediately with soap and water.</li> </ul>
	Cold stress	<ul style="list-style-type: none"> <li>• Workers should wear insulated clothing when temperatures drop below 40°F.</li> <li>• Drink warm beverages on breaks. Refrain from drinking caffeinated beverages.</li> <li>• Remove wet clothing promptly.</li> <li>• Take breaks in warm areas.</li> <li>• Reduce work periods as necessary.</li> <li>• Layer work clothing.</li> </ul>

**Table 5-1**

**Activity Hazard Analysis  
Site Investigation at Former Tank Ranges, Parcels 92Q-X and  
93Q-X, Former Grenade Range, Parcel 107Q-X and Impact  
Areas, Parcels 133Q-X and 134Q-X  
Fort McClellan, Calhoun County, Alabama**

(Page 8 of 14)

Activity	Potential Hazards	Recommended Controls
Surface water, sediment, surface soil and seep sampling (continued)	Access/egress hazards	<ul style="list-style-type: none"><li>• Use qualified and trained bushhog operator.</li><li>• Keep employees out of the bushhog work area.</li><li>• Utilize good housekeeping practices.</li><li>• Keep aisleways, pathways, and work areas free of obstruction.</li><li>• Clean ice or snow off of walkways or work stations.</li><li>• Use appropriate footwear for the task assigned.</li></ul>
	Heat rash	<ul style="list-style-type: none"><li>• Keep the skin clean and dry.</li><li>• Change perspiration-soaked clothing, as necessary.</li><li>• Bathe at end of work shift or day.</li><li>• Apply powder to affected area.</li></ul>
	Heat cramps	<ul style="list-style-type: none"><li>• Drink plenty of cool fluids even when not thirsty.</li><li>• Provide cool fluid for work crews.</li><li>• Move victim to shaded, cool area.</li></ul>
	Heat exhaustion	<ul style="list-style-type: none"><li>• Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature).</li><li>• Set up work/rest periods.</li><li>• Use the buddy system.</li><li>• Allow workers time to acclimate.</li><li>• Have ice packs available for use.</li><li>• Take frequent breaks.</li></ul>
	Heat stroke	<ul style="list-style-type: none"><li>• Evaluate possibility of night work.</li><li>• Perform physiological monitoring on workers during breaks.</li><li>• Wear body cooling devices.</li></ul>

**Table 5-1**

**Activity Hazard Analysis  
Site Investigation at Former Tank Ranges, Parcels 92Q-X and  
93Q-X, Former Grenade Range, Parcel 107Q-X and Impact  
Areas, Parcels 133Q-X and 134Q-X  
Fort McClellan, Calhoun County, Alabama**

(Page 9 of 14)

Activity	Potential Hazards	Recommended Controls
Surface water, sediment, surface soil and seep sampling (continued)	Lightning strikes	<ul style="list-style-type: none"><li>• Whenever possible, halt activities and take cover.</li><li>• If outdoors, get away from elevated locations (i.e., roofs, ladders, equipment).</li><li>• Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground).</li><li>• Seek shelter in a building if possible.</li><li>• Stay away from windows.</li><li>• If available, crouch under a group of trees instead of one single tree.</li><li>• If in a group, keep 6 feet of distance between people.</li></ul>
	UXO	<ul style="list-style-type: none"><li>• UXO avoidance monitoring will be conducted by a UXO specialist prior to beginning activities.</li><li>• If UXO is encountered, cease all activities, mark the location, and notify the site manager and UXO specialist.</li></ul>
Moving and Shipping Collected Samples	Heavy lifting	<ul style="list-style-type: none"><li>• Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size up the lift.</li></ul>
	Pinch points	<ul style="list-style-type: none"><li>• Keep hands, fingers, and feet clear of moving/suspended materials and equipment.</li><li>• Beware of contact points.</li><li>• Stay alert at all times!</li></ul>
	Cut hazards	<ul style="list-style-type: none"><li>• Wear adequate hand protection. Use care when handling glassware.</li></ul>
	Hazard communication	<ul style="list-style-type: none"><li>• Label all containers as to contents and associated hazards.</li></ul>
	Heavy lifting	<ul style="list-style-type: none"><li>• Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size up the lift.</li></ul>

**Table 5-1**

**Activity Hazard Analysis  
Site Investigation at Former Tank Ranges, Parcels 92Q-X and  
93Q-X, Former Grenade Range, Parcel 107Q-X and Impact  
Areas, Parcels 133Q-X and 134Q-X  
Fort McClellan, Calhoun County, Alabama**

(Page 10 of 14)

Activity	Potential Hazards	Recommended Controls
Material Storage	Flammable and combustible liquids	<ul style="list-style-type: none"> <li>• Store in NO SMOKING AREA.</li> <li>• Fire extinguisher readily available.</li> <li>• Transfer only when properly grounded and bonded.</li> </ul>
Disposal of Investigation-Derived Waste (IDW) (Forklift Operation)	Personnel injury, property damage, and/or equipment damage	<ul style="list-style-type: none"> <li>• Use qualified and trained forklift operators.</li> <li>• The operator shall not exceed the load capacity rating for the forklift.</li> <li>• The load capacity shall be clearly visible on the forklift.</li> <li>• Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement.</li> </ul>
	Cross-contamination and contact with potentially contaminated materials	<ul style="list-style-type: none"> <li>• Stop immediately at any sign of obstruction.</li> <li>• Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination.</li> <li>• Only essential personnel will be in the work area.</li> <li>• Real-time air monitoring will take place before and during sampling activities.</li> <li>• All personnel will follow good hygiene practices.</li> <li>• Proper decontamination procedures will be followed.</li> <li>• All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.</li> </ul>
	Cut hazards	<ul style="list-style-type: none"> <li>• Use care when handling glassware.</li> <li>• Wear adequate hand protection.</li> </ul>
High-Pressure Water Jetting Operations	Heavy lifting	<ul style="list-style-type: none"> <li>• Use proper lifting techniques.</li> <li>• Lifts greater than 60 pounds require assistance or mechanical equipment; size up the lift.</li> </ul>
	Slip, trip, and fall hazards	<ul style="list-style-type: none"> <li>• Good housekeeping shall be implemented.</li> <li>• The work area shall be kept clean as feasible.</li> <li>• Inspect the work area for slip, trip, and fall hazards.</li> </ul>

**Table 5-1**

**Activity Hazard Analysis  
Site Investigation at Former Tank Ranges, Parcels 92Q-X and  
93Q-X, Former Grenade Range, Parcel 107Q-X and Impact  
Areas, Parcels 133Q-X and 134Q-X  
Fort McClellan, Calhoun County, Alabama**

(Page 11 of 14)

Activity	Potential Hazards	Recommended Controls
High-Pressure Water Jetting Operations (continued)	Fueling	<ul style="list-style-type: none"> <li>Only approved safety cans shall be used to store fuel.</li> <li>Do not refuel equipment while it is operating.</li> <li>Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.</li> </ul>
	Faulty or damaged equipment	<ul style="list-style-type: none"> <li>Equipment shall be inspected before being placed into service and at the beginning of each shift.</li> <li>Preventive maintenance procedures recommended by the manufacturer shall be followed.</li> <li>A lockout/tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.</li> </ul>
	High-pressure water	<ul style="list-style-type: none"> <li>Jetting gun operator must wear appropriate PPE including hard hat, impact-resistant safety glasses with side shields, water-resistant clothing, metatarsal guards for feet and legs, and hearing protection (if appropriate).</li> <li>One standby person shall be available within the vicinity of the pump during jetting operation.</li> <li>The work area shall be isolated and adequate barriers will be used to warn other site personnel.</li> </ul>
	Unqualified operators	<ul style="list-style-type: none"> <li>Only qualified and trained personnel are permitted to operate machinery and mechanized equipment associated with water jet cutting and cleaning.</li> </ul>
	Out of control equipment	<ul style="list-style-type: none"> <li>No machinery or equipment is permitted to run unattended.</li> <li>Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.</li> </ul>
	Noise	<ul style="list-style-type: none"> <li>Sound levels above 85 dBA mandates hearing protection by nearby site personnel.</li> </ul>
	Activation during repairs	<ul style="list-style-type: none"> <li>All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done.</li> </ul>
	Pinch points	<ul style="list-style-type: none"> <li>Keep feet and hands clear of moving/suspended materials and equipment.</li> <li>Stay alert and clear of materials suspended .</li> </ul>
	Falling objects	<ul style="list-style-type: none"> <li>Hard hats are required by site personnel.</li> <li>Stay alert and clear of material suspended overhead.</li> </ul>
	Flying debris	<ul style="list-style-type: none"> <li>Impact-resistant safety glasses with side shields are required.</li> </ul>

**Table 5-1**

**Activity Hazard Analysis  
Site Investigation at Former Tank Ranges, Parcels 92Q-X and  
93Q-X, Former Grenade Range, Parcel 107Q-X and Impact  
Areas, Parcels 133Q-X and 134Q-X  
Fort McClellan, Calhoun County, Alabama**

(Page 12 of 14)

Activity	Potential Hazards	Recommended Controls
High-Pressure Water Jetting Operations (continued)	Contact with potentially contaminated materials	<ul style="list-style-type: none"><li>All site personnel will wear the appropriate PPE.</li></ul>
Drilling and Installation of Monitoring Wells	Overhead hazards	<ul style="list-style-type: none"><li>Make sure no obstacles are within radius of boom. Always stay a safe distance from power lines.</li></ul>
	Faulty or damaged equipment being utilized to perform work	<ul style="list-style-type: none"><li>All machinery or mechanized equipment will be inspected by a competent mechanic and be certified to be in safe operating condition.</li><li>Equipment will be inspected before being put to use and at the beginning of each shift.</li><li>Faulty/unsafe equipment will be tagged and if possible locked out.</li><li>Drill rigs shall be equipped with reverse signal alarm, backup warning lights, or the vehicle is backed up only when an observer signals it is safe to do so.</li></ul>
	Uneven terrain, poor ground support, inadequate clearances, contact with utilities	<ul style="list-style-type: none"><li>Inspections or determinations of road conditions and structures shall be made in advance to ensure that clearances and load capacities are safe for the passage or placing of any machinery or equipment.</li><li>All mobile equipment and areas in which they are operated shall be adequately illuminated.</li><li>Aboveground and belowground utilities will be located prior to staging equipment.</li><li>Whenever the equipment is parked, the parking brake shall be set.</li><li>Equipment parked on inclines will have the wheels chocked.</li><li>Inspect brakes and tire pressure on drill rig before staging for work.</li></ul>
	Inexperienced operator	<ul style="list-style-type: none"><li>Machinery and mechanized equipment shall be operated only by designated personnel.</li><li>Operators shall inform their supervisor(s) of any prescribed medication that they are taking that would impair their judgment.</li></ul>
	Jacks/outriggers	<ul style="list-style-type: none"><li>Ensure proper footing and cribbing.</li></ul>
	Falling objects	<ul style="list-style-type: none"><li>Remove unsecured tools and materials before raising or lowering the derrick.</li><li>Stay alert and clear of materials suspended overhead.</li></ul>
	Pinch points	<ul style="list-style-type: none"><li>Keep feet and hands clear of moving/suspended materials and equipment.</li><li>Stay alert at all times!</li></ul>

**Table 5-1**

**Activity Hazard Analysis  
Site Investigation at Former Tank Ranges, Parcels 92Q-X and  
93Q-X, Former Grenade Range, Parcel 107Q-X and Impact  
Areas, Parcels 133Q-X and 134Q-X  
Fort McClellan, Calhoun County, Alabama**

(Page 13 of 14)

Activity	Potential Hazards	Recommended Controls
Drilling and Installation of Monitoring Wells (continued)	Fire	<ul style="list-style-type: none"> <li>Mechanized equipment shall be shut down prior to and during fueling operations.</li> <li>Have fire extinguishers inspected and readily available.</li> </ul>
	Fall hazards	<ul style="list-style-type: none"> <li>Personnel are not allowed to work off of machinery or use them as ladders.</li> <li>Use fall protection when working above 6 feet.</li> </ul>
	Contact with rotating or reciprocating machine parts	<ul style="list-style-type: none"> <li>Use machine guards; use long-handled shovels to remove auger cuttings.</li> <li>Safe lockout procedures for maintenance work.</li> </ul>
	Heavy lifting	<ul style="list-style-type: none"> <li>Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size up the lift.</li> </ul>
	Slip, trip, and fall hazards	<ul style="list-style-type: none"> <li>Practice good housekeeping, keep work area picked up and clean as feasible.</li> <li>Continually inspect the work area for slip, trip, and fall hazards.</li> </ul>
	Contact with potentially contaminated materials	<ul style="list-style-type: none"> <li>Real-time air monitoring will take place. If necessary, proper personal protective clothing and equipment will be utilized.</li> <li>Stop immediately at any sign of obstruction.</li> <li>Do not breathe air surrounding the boring unless necessary.</li> <li>Upgrade to respirator if necessary.</li> <li>Avoid skin contact with soil cuttings. Wear gloves.</li> <li>Stay clear of moving parts of drill rig.</li> </ul>
	Drum handling	<ul style="list-style-type: none"> <li>Be careful not to breathe air from around open drum any more than necessary. Monitor with photoionization detector/flame ionization detector (PID/FID) equipment and upgrade to respirator if necessary.</li> <li>When filling a drum (with either soil or water), be careful not to make contact with the contained waste. Wear appropriate gloves. Make sure lid or bung of drum is secure.</li> <li>If moving a drum unassisted, be sure to leverage properly, use proper lifting techniques, and wear safety glasses and steel-toed boots.</li> <li>When using a drum dolly, make sure straps and lid catch are securely attached. Leverage properly when tilting drum. Be sure toes stay away from drum.</li> </ul>

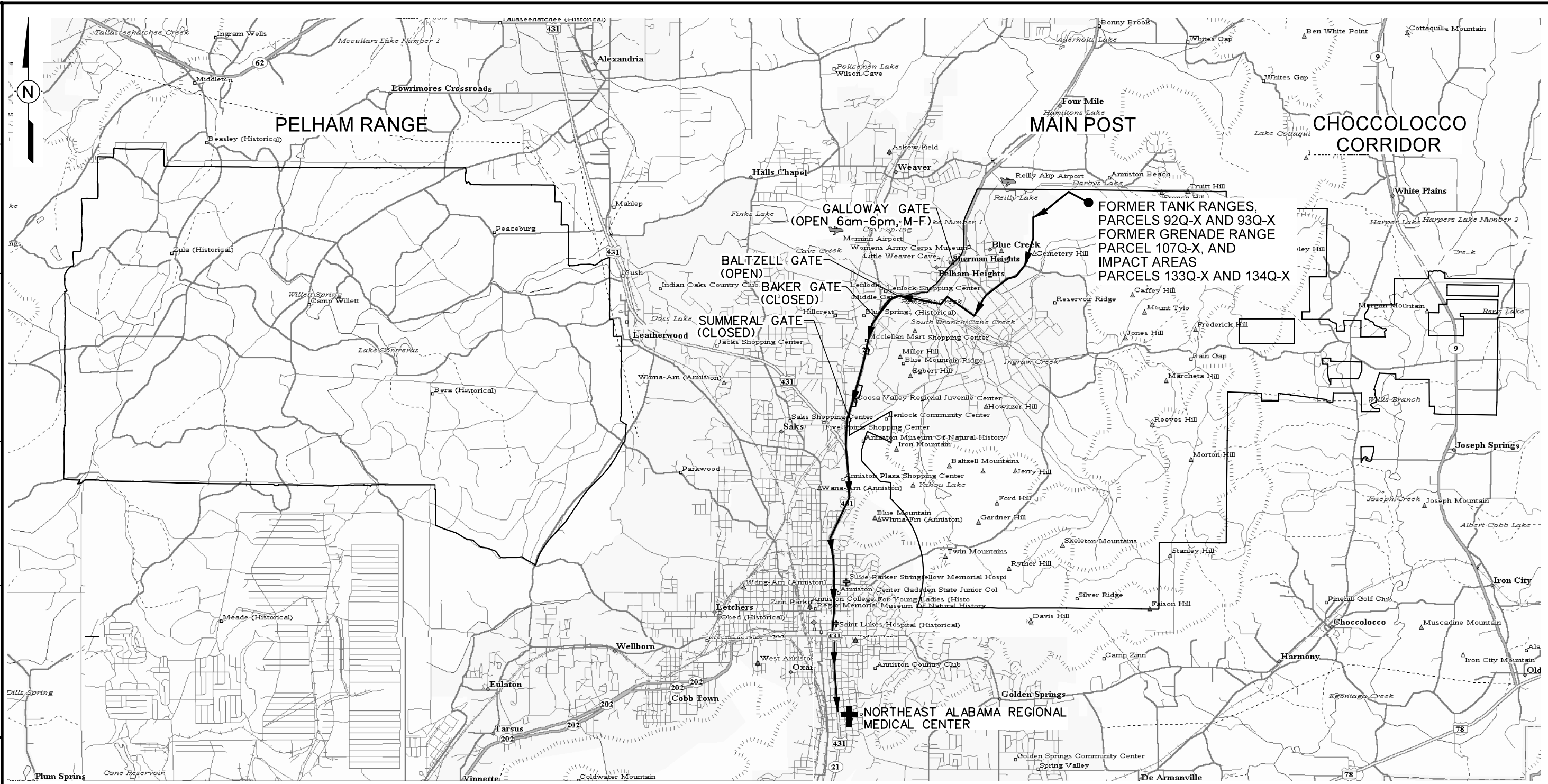


**Table 5-1**

**Activity Hazard Analysis  
Site Investigation at Former Tank Ranges, Parcels 92Q-X and  
93Q-X, Former Grenade Range, Parcel 107Q-X and Impact  
Areas, Parcels 133Q-X and 134Q-X  
Fort McClellan, Calhoun County, Alabama**

(Page 14 of 14)

Activity	Potential Hazards	Recommended Controls
Drilling and Installation of Monitoring Wells (continued)	UXO	<ul style="list-style-type: none"><li>• UXO avoidance monitoring will be conducted by a UXO specialist prior to beginning activities.</li><li>• UXO avoidance monitoring shall apply to all intrusive activities associated with well construction completion.</li><li>• If UXO is encountered, cease all activities, mark the location, and notify the site manager and UXO specialist immediately.</li></ul>



**ATTACHMENT 1**

**EVALUATING OE/UXO/CWM HAZARDS IN SUPPORT  
OF HTRW ACTIVITIES**


Site Name: Parcels 92Q-X, 93Q-X, 107Q-X, 133Q-X, and 134Q-X

Job Number: 796887

Date: 6-Dec-01

Name of person completing form: Nicole Badon

Title: Geologist

Signature: 

1a. Have the historical records available for this HTRW site been reviewed? Yes ☒ No ☐

If the answer to 1a. is yes, proceed to 1b.

If the answer to 1a. is no, review site information prior to completing this form.

1b. Is there recent information (site walk, worker interviews, etc.) that indicates a potential OE/CWM hazard at this site? Yes ☒ No ☐

Proceed to 2.

2. According to the records review, is this site known or suspected to have been used for:

	Yes	No
2a. Manufacturing, production, or shipping of conventional or chemical warfare materiel (CWM) OE:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Live fire testing of any ordnance:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Conventional or CWM OE training:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Storage of conventional or CWM OE:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Disposal or demilitarization of conventional or CWM OE:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other (specify):		

	Yes	No
2b. Manufacturing, production, or shipping of chemical agent:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Research or testing of chemical agent:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Chemical agent related training:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Storage of chemical agent:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Disposal or demilitarization of chemical agent:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other (specify):		

Any 2a question answered "YES" indicates UXO support is required for all site activities. If all 2a questions are answered "NO", UXO support may not be required. Refer to Installation-Wide Safety and Health Plan (SHP) for additional information concerning UXO support. Proceed to question 2b.

Any 2b question answered "YES" requires the remainder of this form to be completed. If all 2b questions are answered "NO", real-time monitoring for chemical agent will not be required and completing the remainder of this form is not required. Refer to SHP for additional information concerning agent monitoring.

Additional space for notes and explanations on page 4.

Continue to page 2 of 4 –

## Page 2 of 4

**Date: 6-Dec-01**

<b>3. For sites where the manufacturing, testing, storage, or disposal of CWM is suspected:</b>	<b>Yes</b>	<b>No</b>
Is there evidence that the CWM is/was containerized in potentially unexploded ordnance:	<input type="checkbox"/>	<input type="checkbox"/>
Is there evidence that the CWM is/was containerized in nonexplosive containers:	<input type="checkbox"/>	<input type="checkbox"/>
Is there evidence that the CWM is open to the environment (i.e., in an open container or free liquid/solid in the soil/water):	<input type="checkbox"/>	<input type="checkbox"/>
Is there evidence that the CWM hazard has been removed from the site or that the site has been decontaminated:	<input type="checkbox"/>	<input type="checkbox"/>
Has the site been previously monitored or sampled for chemical agent or agent breakdown products:	<input type="checkbox"/>	<input type="checkbox"/>
For any "YES" above, was the agent or breakdown product identified?	<input type="checkbox"/>	<input type="checkbox"/>

**For any "Yes", list types of agent (mustard, lewisite, etc.) and the form (in ordnance, in drum, etc.) the CWM is expected to be found (or state "unknown"):**

**List agent breakdown products identified:**

4. Defining the Potential for the Presence of CWM:	Agent Monitoring Requirements for Site Activities:
<p><b>4a. High Presence Potential – Definition:</b> CWM is known or highly suspected to be present at the site in a condition (within ordnance and/or nonexplosive container, or in an uncontainerized form in sufficient volume that weathering of the product has not rendered it harmless) that will cause potential harm to personnel if it is encountered.</p>	<p>Mandatory personal and perimeter air monitoring using the DAAMS, MINICAMS, and RTAP collection/analysis methods with off-site surety laboratory confirmation of all environmental samples. Specific monitoring criteria (equipment types and sampling station placement, percentage of personnel monitored, etc.) to be established in the Site Specific Safety and Health Plan (SSHP).</p>
<p><b>4b. Moderate Presence Potential - Definition:</b> CWM is suspected to have been present at the site, but has been previously removed and/or decontaminated, or has been open to the environment such that it is expected to have degraded and been rendered harmless.</p>	<p>The need for personal and perimeter air monitoring using the DAAMS, MINICAMS, and RTAP collection/analysis methods with off-site surety laboratory confirmation of all environmental samples will be reviewed on a site-by-site basis. Specific monitoring criteria (equipment types and sampling station placement, percentage of personnel monitored, etc.) to be established in the Site Specific Safety and Health Plan (SSHP).</p>
<p><b>4c. Low Presence Potential – Definition:</b> No indications that CWM will be present in quantity or reactivity (in munitions, projectiles, drums, etc.).</p>	<p>No specific personal or area monitoring for chemical agents required beyond what is specified in the SHP.</p>

**Continue to page 3 of 4 -**

# Evaluating OE/UXO/CWM Hazards in Support of HTRW Activities

Page 3 of 4

Site Name: Parcels 92Q-X, 93Q-X, 107Q-X, 133Q-X, and 134Q-X

Job Number: 796887

Date: 6-Dec-01

Based on the information available for this site, including information gathered during completion of this form, the potential for CWM to be present at this site, as defined above, is expected to be: **LOW**

Exceptions/Explanations:

(additional space for notes and explanations on page 4)

5. Based on the information provided in questions 1 through 5, above, the following guidelines will be used for establishing PPE requirements for activities to be performed at this site; Specific details are provided in the SSHP:

5a. High Exposure Potential - High exposure potential is determined by evaluating the potential presence of CWM in conjunction with the task(s) to be performed, as well as the specific location and duration of the task(s).

Subject to review by the IT CIH, PPE for all personnel in the exclusion zone at a site identified as having a "High Exposure Potential" will be Level B (supplied air) or Level C (full-face respirator with HEPA/Acid Gas/OV cartridges w/ emergency egress hood) and chemically resistant coveralls. Specific PPE requirements are in the SSHP for this site.

5b. Moderate Exposure Potential - Moderate exposure potential is determined by evaluating the potential presence of CWM in conjunction with the task(s) to be performed, as well as the specific location and duration of the task(s).

Subject to review by the IT CIH, PPE for all personnel in the exclusion zone at a site identified as having a "Moderate Exposure Potential" will be Modified Level D (disposable coveralls and emergency egress hood) carried by all personnel. Specific PPE requirements are in the SSHP for this site.

5c. Low Exposure Potential - Low exposure potential is determined by evaluating the potential presence of CWM in conjunction with the task(s) to be performed, as well as the specific location and duration of the task(s).

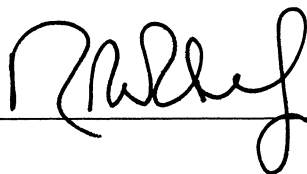
Subject to review by the IT CIH, no additional PPE requirements above those stated in the SSHP are needed for sites identified as having "Low Exposure Potential." Specific PPE requirements are in the SSHP for this site.

Based on all available information, the exposure potential at this site is considered to be: **LOW**

Exceptions/Explanations:

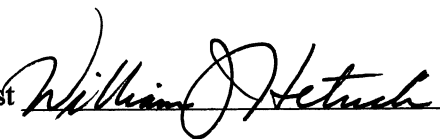
Review Signatures:

IT UXO Technical Manager



Date: 12 Dec 01

IT H&S Specialist



Date: 1/15/02

**Site Name: Parcels 92Q-X, 93Q-X, 107Q-X, 133Q-X, and 134Q-X**

**Job Number: 796887**

**Date: 6-Dec-01**

***Additional Notes and Explanations:***

Parcels 92Q-X and 93Q-X are identified as former tank ranges, Parcel 107Q-X is identified as a former grenade range, and Parcels 133Q-X and 134Q-X are identified as impact areas. There is no reported use of CWM at these ranges; therefore, the potential for CWM to be present at this site is low.





**Final  
Site-Specific Unexploded Ordnance Safety Plan Attachment  
Site Investigation at the Former Tank Ranges, Parcels 92Q-X  
and 93Q-X, Former Grenade Range, Parcel 107Q-X, and  
Impact Areas, Parcels 133Q-X and 134Q-X, at  
Fort McClellan, Calhoun County, Alabama**

**Prepared for:**

**U.S. Army Corps of Engineers, Mobile District  
109 St. Joseph Street  
Mobile, Alabama 36602**

**Prepared by:**

**IT Corporation  
312 Directors Drive  
Knoxville, Tennessee 37923**

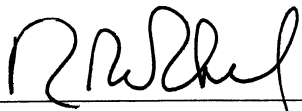
**Task Order CK10  
Contract No. DACA21-96-D-0018  
IT Project No. 796887**

**January 2002**

**Revision 0**

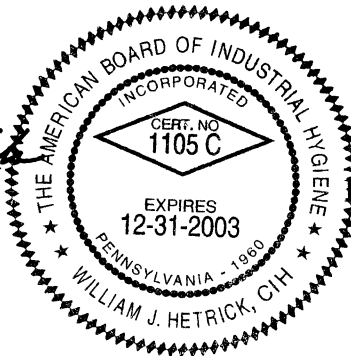
**Final**  
**Site-Specific Unexploded Ordnance Safety Plan Attachment**  
**Site Investigation at the Former Tank Ranges, Parcels 92Q-X**  
**and 93Q-X, Former Grenade Range, Parcel 107Q-X and**  
**Impact Areas, Parcels 133Q-X and 134Q-X**

I have read and approve this site-specific unexploded ordnance (UXO) safety plan attachment for the Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X and Impact Areas, Parcels 133Q-X and 134Q-X at Fort McClellan, Alabama, with respect to project hazards, regulatory requirements, and IT Corporation UXO procedures.

  
Robert W. Hickman, Jr.  
UXO Technical Manager

12 DEC 01  
Date

  
William J. Hetrick, CIH  
Health & Safety Manager



1/15/02  
Date

## **Table of Contents**

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	<b>Page</b>
List of Acronyms .....	ii
1.0 Introduction .....	1
2.0 UXO Team Composition.....	2
3.0 Responsibilities .....	2
4.0 Authority .....	3
5.0 UXO Avoidance Procedures to Support HTRW Sampling Activities at FTMC .....	3
6.0 Safety .....	6
7.0 Quality .....	7
8.0 References .....	7
Attachment 1 - Fort McClellan Unexploded Ordnance Supplementary Procedures	

## ***List of Acronyms***

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See Attachment 1, List of Abbreviations and Acronyms, of the Site-Specific Field Sampling Plan Attachment contained in this binder.

## 1.0 Introduction

---

This document defines anomaly avoidance procedures for activities to be performed by IT Corporation (IT) unexploded ordnance (UXO) personnel in conjunction with the site investigation at the Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X, at Fort McClellan (FTMC), Calhoun County, Alabama. This document is not a stand-alone document; it must be used in conjunction with the *Fort McClellan Unexploded Ordnance Supplementary Procedures* (IT, 2001), attached as Attachment 1.

IT UXO personnel will perform visual surveys, assisted by hand-held magnetometers and metal detectors, to support the collection of surface soil, subsurface soil, groundwater, surface water, and sediment samples for chemical analysis at the Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X. The purpose is to avoid any ordnance and explosives (OE) during hazardous, toxic and radioactive waste (HTRW) sampling activities. Intrusive anomaly investigation is not authorized for this site work.

Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X, are located in the northern area of the Main Post of FTMC.

Parcel 92Q-X is identified as a former tank range. The exact dates of use and types of ordnance fired at the range are unknown (Environmental Science and Engineering, Inc. [ESE], 1998). Parcel 92Q-X is located south of Falcon Road and extends to the southeast toward Mout Road. Syracuse Street spans the length of the parcel inside its western border. The elevation of Parcel 92Q-X ranges from approximately 805 to 960 feet above mean sea level (msl), and the ground surface slopes to the northwest.

Parcel 93Q-X is identified as a former tank range and is located just west of Parcel 92Q-X. Parcel 93Q-X ranges in elevation from approximately 810 to 950 feet above msl. An intermittent creek transects the parcel from southeast to northwest. The overall surface drainage is to the northwest and the intermittent creek exits the parcel approximately 300 feet south of the firing line. The exact dates of use of the range and types of ordnance fired are unknown (ESE, 1998).

Parcel 107Q-X is identified as a former grenade range. The range fan extends toward the southeast; therefore, direction of fire is suspected to have been to the southeast. The range fan encompasses Parcels 93Q-X, 133Q-X, and 134Q-X in their entirety and extends beyond this SI study area. The exact dates of operations and types of ordnance used are unknown (ESE, 1998).

Parcels 133Q-X and 134Q-X are identified as impact areas (ESE, 1998). Parcel 133Q-X is located entirely within the range fan of Parcel 93Q-X. The elevation of Parcel 133Q-X ranges from 830 to 910 feet above msl, and ground surface slopes to the northeast. Parcel 134Q-X is located just to the east of the impact area of Parcel 92Q-X. The overall elevation of Parcel 134Q-X ranges from 820 to 910 feet above msl, and ground surface slopes to the northwest. An intermittent creek transects the parcel from the southeast to the northeast, with a directional flow towards the northeast.

## **2.0 UXO Team Composition**

---

UXO team and personnel requirements will be in accordance with EP 75-1-2 (U.S. Army Corps of Engineers, 2000) and installation-wide sampling and analysis plan for FTMC (IT, 2000). A UXO team will be on site during all sampling or intrusive activities where OE is suspected.

## **3.0 Responsibilities**

---

The UXO Team Leader is responsible for ensuring that personnel performing UXO tasks at FTMC have the required qualifications. The UXO Team Leader supervises and coordinates UXO work activities.

The UXO team member(s) will provide UXO avoidance and explosive ordnance recognition, location, and safety functions for IT employees and any subcontractors during sampling activities. Sampling activities at this site include surface and subsurface soil sampling, drilling and installing monitoring wells, sampling of monitoring wells, surface water and sediment sampling, survey of sample points, and safe access and egress to and from the site in support of HTRW sampling operations.

## **4.0 Authority**

---

UXO personnel are authorized to perform UXO avoidance activities only. UXO personnel are not permitted to initiate OE investigative or disposal activities.

## **5.0 UXO Avoidance Procedures to Support HTRW Sampling Activities at FTMC**

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The scope of work for site investigation activities at the Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X, and Impact Areas, Parcels 133Q-X and 134Q-X, includes the following UXO tasks:

- Provide UXO avoidance support during the collection of 36 surface soil samples, 36 subsurface soil samples, 10 groundwater samples, 7 surface water samples, 8 sediment samples, and 1 seep sample. Sample locations and definitions of samples to be taken are given in Section 4.0 of the site-specific field sampling plan contained in this binder.
- Provide downhole UXO support for all intrusive drilling to determine buried downhole hazards.
- Provide surveys for all intrusive field activities (e.g., digging, fence-post driving, grading, or excavation).

Since these areas may contain OE contamination, the UXO team must conduct a surface access survey for UXO before any type of activities commence. This includes foot and vehicular traffic. UXO avoidance activities at the Former Tank Ranges, Parcels 92Q-X and 93Q-X, Former Grenade Range, Parcel 107Q-X and Impact Areas, Parcels 133Q-X and 134Q-X, will include:

- a) Access Corridors and Sampling Sites
  - (1) The UXO team will conduct access surveys of the footpaths and vehicular lanes approaching and leaving each of the investigation sites. Access surveys will begin in a known clear area and proceed by the most direct route to the sampling site. The boundaries of the access route and sampling site will be marked with white tape or white pin flags.
  - (2) If an OE item is found during the survey, the location will be conspicuously marked with a red pin flag and avoided by altering the

route. Subsurface anomalies will be marked with a yellow flag and avoided by altering the route. Additionally, UXO personnel will complete the IT FTMC "Unexploded Ordnance Report Form."

- (3) The boundaries of the access route and sampling site will be recorded in the IT FTMC "UXO Sketch Log" by the UXO technician. Additionally, anomaly locations will be recorded on this form.
- (4) Instrumentation used at this site will include the Schonstedt GA 72, the CST Corporation Magna-Trak 102, or the Whites Spectrum XLT Metal Detector. Additionally, the Schonstedt MG-220 or MG-230 will be set up for downhole monitoring. All equipment will be operated as specified in the appropriate operator's manual. All equipment will be function-tested prior to use following the procedure in paragraph 3.2, *FTMC UXO Supplementary Procedures* (IT, 2001) and the operator's instructions. The Whites Metal Detector will be used in conjunction with hand-held magnetometers in areas of high concentrations of rocks with a magnetic signature to assist in eliminating anomalies created by "hot rocks."
- (5) The access route will be twice as wide as the widest vehicle that will use the route. Footpath lanes will be a minimum of three feet wide.
- (6) If surface OE or subsurface anomalies are encountered that cannot be avoided, the access route must be diverted to avoid contact. No personnel will be allowed outside of the surveyed areas without a UXO escort. No unescorted access is permitted inside the corridor area until a survey has been completed and boundaries established.
- (7) At the actual investigation site, the UXO team must also complete a survey of an area sufficient to support mechanical excavation equipment maneuverability, parking of support vehicles, and establishment of decontamination stations. At a minimum, the surveyed area should have a dimension in all directions equal to twice the length of the largest vehicle or piece of equipment to be brought on site. White pin flags or tape will be used to mark the boundaries of the surveyed site.
- (8) Surface soil samples are normally collected at depths of 0 to 12 inches below ground surface. The UXO team will survey the area of the soil sampling site for any indication of OE. Sampling is not permitted at any location where an anomaly has been detected.
- (9) Tracked or other vehicles whose movement would disturb the soil are authorized for use only in areas that have been surveyed and in which no anomalies have been detected.



- (10) If grading or soil movement is required to support access corridor development or a sampling location, UXO personnel will perform a survey. After an area has been surveyed and no anomalies have been detected, soil can be removed at a rate of no more than one foot per cut. If additional grading is required, another survey will be performed after each one foot of soil has been removed.
- (11) Erosion and weathering will typically cause some OE items to leach to the surface or otherwise be uncovered. In cases where access corridors or sampling sites have not been surveyed or traversed for a period of time, additional surveys may be required. The decision regarding the performance of follow-on surveys will be made by the site superintendent with input provided by the FTMC UXO Safety Officer and FTMC UXO Team Leader. The decision will be based on such factors as the amount of time since the last survey was performed, the weather during this period, the terrain in the area of concern, the former use of the area, and the type and quantity of OE found during initial surveys.
- (12) Incremental geophysical surveys at drill hole locations will be initially accomplished using a hand auger to install a pilot hole. An access survey of the immediate vicinity of the pilot hole location will precede the installation of the pilot hole. The UXO team will use a manual or mechanical portable auger to install the pilot hole. The augered hole will be inspected for anomalies with a geophysical instrument (configured for downhole utilization) in two-foot increments as the hole is advanced below ground surface. Hand augering of a hole will not proceed if an anomaly is detected that cannot be positively identified as inert material. If a suspect OE item is encountered, the sampling personnel must select a new drill hole location. The pilot hole will also be inspected with the geophysical instrument upon reaching the final depth of the hand-augered hole, providing a total clearance depth equal to pilot hole depth plus two feet. If the proposed site is still free of magnetic anomalies, the drilling equipment may be brought on site and utilized. The UXO team will continue to inspect the drill hole for anomalies at two-foot increments as the drilling is advanced from the clearance depth of the pilot hole until a depth of 12 feet is reached.

b) Vegetation Removal

In cases where removal of large trees or other vegetation is required to support access or sampling operations, the procedures in paragraph 4.2, *FTMC UXO Supplementary Procedures* (IT, 2001) will be followed.

c) Magnetometer/Metal Detector Checkout and Field Procedures

The procedures in paragraph 3.0, *FTMC UXO Supplementary Procedures* (IT, 2001) will be followed. Since these areas include portions of a tank and grenade range area, the function test will utilize the function test ordnance that most closely approximates the MK 2 grenade, 60mm mortar, 2.36-inch rocket warhead, and/or 75mm projectile.

d) UXO Logbooks and Documentation

All UXO personnel identified in paragraph 5.0, *FTMC UXO Supplementary Procedures* (IT, 2001) will maintain a logbook in accordance with that procedure.

## 6.0 Safety

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In addition to the requirements of the site-specific safety and health plan prepared for this site, the UXO personnel will ensure the following:

- a) During the access and subsurface surveys conducted with a geophysical instrument, the UXO team members will not wear safety shoes or other footwear that would cause the instrument to present a false response.
- b) The UXO team will not be required to wear protective helmets unless an overhead hazard is present.
- c) The FTMC UXO Safety Officer will monitor UXO activities to ensure compliance with applicable safety requirements.
- d) The FTMC UXO Safety Officer will certify that all FTMC UXO workers are capable of performing UXO activities at FTMC based on observation of work performance.
- e) The FTMC UXO Safety Officer is responsible for all site-specific UXO training.
- f) The UXO technician on site will advise project personnel regarding all evacuation and/or exclusion zones as appropriate. The UXO technician will monitor all sampling site activities to ensure that only the minimum number of personnel are present on site.

## 7.0 Quality

---

The IT FTMC UXO Quality Control Officer will follow quality control instructions and procedures appropriate to this task listed in Section 9.0 of the installation-wide OE management plan contained in Volume IV of the installation-wide sampling and analysis plan (IT, 2000) appropriate to this task and the *FTMC UXO Supplementary Procedures*. The IT FTMC UXO Quality Control Officer will also use the “UXO Avoidance Quality Control Report” to document his activities. Copies of this form will be provided to the IT quality assurance representative upon request.

## 8.0 References

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Environmental Science and Engineering, Inc. (ESE), 1998, *Final Environmental Baseline Survey, Fort McClellan, Alabama*, prepared for U.S. Army Environmental Center, Aberdeen Proving Ground, Maryland, January.

IT Corporation (IT), 2001, *Fort McClellan Unexploded Ordnance Supplementary Procedures*, June.

IT Corporation (IT), 2000, *Final Installation-Wide Sampling and Analysis Plan, Fort McClellan, Calhoun County, Alabama*, March.

U. S. Army Corps of Engineers (USACE), 2000, *Engineering Publication EP 75-1-2, Unexploded Ordnance (UXO) Support During Hazardous, Toxic, and Radiological Waste (HTRW) and Construction Activities*, 20 November.

## **ATTACHMENT 1**

# **FORT MCCLELLAN UNEXPLODED ORDNANCE SUPPLEMENTARY PROCEDURES**

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## **FTMC UXO SUPPLEMENTARY PROCEDURES**

**Subject: Ordnance and Explosives**

---

### **1.0 INTRODUCTION**

IT Corporation (IT) has been retained by the U.S. Army Corps of Engineers-Mobile District, under Contract Number DACA21-96-D-0018, to provide environmental services related to Base realignment and closure (BRAC) of Fort McClellan, Alabama. The Installation-Wide Ordnance and Explosives (OE) Management Plan for Fort McClellan (FTMC) was prepared by IT Corporation and submitted as a final document in March 2000. The Installation-Wide OE Management Plan was prepared to provide general guidance for conducting unexploded ordnance (UXO) work associated with hazardous, toxic, and radiological waste (HTRW) investigations and remedial activities currently in progress at FTMC. IT Corporation prepares site-specific field sampling, health and safety, and UXO safety plans for sites where fieldwork will occur that may potentially contain OE. A UXO Safety Plan is not prepared for sites that are not reported to be in areas containing OE.

#### **1.1 Purpose**

This document is intended to provide procedures to the field staff that outline UXO operations and clarify activities currently permitted under "anomaly avoidance." The document is not intended to replace any of the project documents currently approved; rather, it is intended to complement those documents with additional information that allows successful completion of the job.

### **2.0 FTMC EMPLOYEE ORIENTATION/TRAINING AND CERTIFICATION**

The IT FTMC orientation program is designed to:

- Indoctrinate new employees to FTMC-unique procedures
- Verify compliance with regulatory certification requirements
- Provide continuing instruction and updating in UXO fundamentals to sustain readiness to safely perform UXO tasks

## **2.1 Responsibilities**

The IT OE Service Center Operations Manager will oversee the training programs and maintain a master record of UXO employee training and certification status.

The UXO person designated as the senior IT UXO individual at FTMC will schedule the orientation listed below.

The FTMC UXO Safety Officer will:

- Conduct all UXO-specific orientation and training at FTMC
- Certify that each new UXO employee is capable of performing UXO work activities at FTMC
- Maintain FTMC training files and records on each UXO technician on site reflecting his or her current training status.

## **2.2 UXO Employee Orientation**

Every UXO employee assigned to FTMC will receive a site-specific UXO orientation in addition to training required by the Occupational Health and Safety Administration (OSHA). This orientation will include, as a minimum, the following topics:

- Local emergency response drills and procedures
- Personal protective equipment (PPE) and personnel decontamination procedures
- Ordnance recognition/UXO expected to be encountered at FTMC
- Equipment safety
- FTMC site orientation
- Chemical warfare material (CWM) awareness and procedures
- Communications procedures
- FTMC Logbook/data recording procedures
- IT administrative policies and procedures
- Magnetometer checkout procedures.

Upon completion of the UXO employee orientation, the FTMC UXO Safety Officer will monitor the performance of the new hire for at least three workdays while conducting typical UXO activities. The FTMC UXO Safety Officer will

then certify that the individual is capable of performing UXO activities at FTMC based upon satisfactory performance of the three-day period. A copy of this certification will be maintained in the individual's site FTMC training file (see example at Attachment 1).

### **2.3 UXO Sustainment Training**

All UXO technicians have had the OSHA 40-hour hazardous waste operations and emergency response (HAZWOPER) course in order to be initially certified at FTMC. They are also required to maintain the certification with an 8-hour OSHA refresher course on an annual basis. Additionally, all IT FTMC UXO personnel will have 8 hours of site-specific annual UXO sustainment training. This training can be performed incrementally (2 hours every quarter) at the discretion of the site superintendent in coordination with the FTMC IT UXO Safety Officer. Topics will include, but are not limited to, the following subjects:

- Site-specific environmental hazards
- Site-specific UXO hazards, ordnance fuzing, functioning and precautions
- Topics which the IT UXO Team Leader or IT Safety UXO Officer determines necessary to support FTMC UXO activities

Sustainment training will be conducted for a period of no less than 8 hours. Daily safety briefings, tailgate safety meetings, and other required site-specific training are not a substitute for this training. The purpose of this training is to provide each UXO employee with site-specific UXO training over and above OSHA requirements. The site-specific UXO training will be recorded in the project file and the UXO employee's personnel file.

## **3.0 FTMC MAGNETOMETER/METAL DETECTOR FUNCTION TEST AND FIELD PROCEDURES**

This section provides FTMC magnetometer/metal detector function tests and operating procedures to be employed at all work sites that have been identified as requiring avoidance support.

### **3.1 Geophysical Test Plot**

The purpose of a test plot is to provide a consistent environment where the equipment can be evaluated. The location of the geophysical test plot will be inside the IT compound. It will be established as follows

- The test plot will consist of an area approximately 20 x 20 feet and clear of vegetation and magnetic anomalies, located in the IT compound next to the southeast end of the office trailers.
- Five metal test objects will be buried at depths varying from 6 inches to 24 inches. The objects will approximate the weight, diameter, and length of an MK 2 grenade, a 60mm mortar, a 2.36-inch rocket warhead, a 75mm projectile, and a 37mm projectile. Additionally, three non-ferrous test objects will be buried at a depth of 2 inches to 8 inches. A 6-inch length of 1/2-inch reinforcing rod will be placed on the surface for use as a surface check source. Items with greater mass will be buried at greater depths. Each burial location will be marked with a wooden stake located about 6 inches to the north of the object. Each stake will be assigned a reference number and will be tagged or marked to denote the depth, type of item and orientation of the item. The site will utilize native soils; no fill material will be brought in from another area. Sand will be used to cover the area to mitigate the effects of wet weather.
- For downhole magnetometer testing, a length of 2-inch PVC pipe will be buried to a depth of 36 inches. The pipe should be of sufficient length to allow at least another 24 inches to extend above the surface of the ground. A metal object will be buried at a depth of 24 inches and 24 inches from the side of the pipe. The location of the item, similar in size and mass to a 75mm projectile, will be marked with a wooden stake tagged to denote the depth, type of item, orientation, and reference number assigned.

### **3.2 Magnetometer/Metal Detector Check-Out Procedures**

- Prior to field use, all magnetometers and metal detectors will be set up following the guidelines in the manufacturer's operating manual for the specific instrument used. Instrumentation used at this site will include the Schonstedt GA 72, the CST Corporation Magna-Trak 102, or White's Spectrum XLT Metal Detector. Additionally, the Schonstedt MG-220 or MG-230 will be set up for downhole monitoring. All equipment will be operated in a manner consistent with instructions contained in the appropriate operator's manual. All equipment will be function-tested prior to use. The White's Metal Detector will be used in conjunction with hand-held magnetometers in areas of high concentrations of rocks with a



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magnetic signature, to assist in eliminating anomalies created by “hot rocks.” The operating manual for each of the instruments used at FTMC will be available for use with the equipment.

- Once the instrument has been determined to be working according to the manufacturer’s operating manual, the operator will perform a function test on the FTMC geophysical test plot using the detection methods described in the manual. A function test will consist of using the instrument over a minimum of three test sources. The same sources will be used during each function test to ensure consistency. The instrument detection indicator, as described in the operator’s manual, will be noted in the instrument logbook. For site checks, a 6-inch length of 1/2-inch steel reinforcing rod will be available to each operator at the work site.
- Instruments that fail to reproduce a detection indication consistent with previous tests will be checked to ensure that the power supply or batteries are sufficient. If the power supply is determined to be sufficient and the operator cannot find a fault in accordance with the operator’s manual, the instrument will be tagged and removed from service.
- Function tests will be performed each morning before the equipment is put into service.
- If an instrument is determined to be working improperly, the FTMC UXO Team Leader and the site superintendent will be immediately notified. Any activities performed using that instrument since its last positive test procedure will be considered invalid and will require reevaluation.
- Upon completion of the function test, the “Magnetometer/Metal Detector Functions Test Data Sheet” (Attachment 2) and the equipment logbook will be filled out.
- After an instrument has been function-tested at the beginning of each day, the instrument will be checked at least once during every hour of use or each time the instrument is turned on after having been turned off. This check will consist of dropping the 6-inch length of 1/2-inch reinforcing rod in a clear area and passing the detector over the rod in a manner consistent with the operator’s instructions. The instrument indication will be compared to the indication produced during the morning function test.

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Instruments that fail to produce a consistent indication will be checked and removed from service as required.

### **3.3 Equipment Documentation**

Each piece of equipment will be assigned a logbook noting the make, model, manufacturer, and serial number of the equipment. The logbook and manufacturer's operating manual will be present when the equipment is tested. The following information will be recorded:

- Date and time
- The test plot object used (assigned stake number)
- The reading or indication at each test site
- Whether or not the reading or indication was satisfactory
- The name of the individual performing the test.

The IT FTMC Quality Control (QC) Officer will observe the daily testing of all equipment and will record the results of each test in his field logbook.

### **3.4 Magnetometer/Metal Detector Field Procedures**

All intrusive field activities in potential OE areas (e.g., digging, fence post driving, grading, well installation or excavation) will be preceded by a UXO sweep. Each hole made in areas where OE may potentially be found will have a check immediately over the spot of the intrusion. Magnetometer operations at FTMC will assume a detection depth of one foot when surveying an area for excavation.

All magnetometers and metal detectors will be operated in accordance with the manufacturers specifications and procedures.

When surveying a potential area for a sampling well, an area of sufficient size will be surveyed to allow for installation of required pads and bollards. After the well is installed, the location of bollards will be adjusted as required if an anomaly is detected during the bollard installation process.

The White's Metal Detector will be used to augment the magnetometers on sites where "hot rocks" are suspected. The purpose of using the metal detector in addition to the magnetometers is to eliminate the probability of "hot rocks."

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## **4.0 FTMC ACCESS CLEARANCES, VEGETATION REMOVAL, AND ROAD MAINTENANCE**

This section is designed to provide specific procedures regarding activities associated with the building of access corridors, vegetation removal, and road maintenance in support of FTMC operations.

### **4.1 Access Corridors**

The purpose of access corridors is to enable IT personnel access to well and/or other types of sampling sites within FTMC. Access corridors will be created by marking the route, both length and width, in which a UXO survey has been performed. The marking method will be defined in each site-specific UXO safety plan. No unescorted access is permitted until a corridor has been established. If an anomaly is detected during the survey or during a subsequent excavation, it must be avoided, since investigation is not authorized. The route will be altered to avoid the anomaly for FTMC activities. A magnetometer is considered to reliably detect anomalies to a depth of one foot.

The size of each area to be surveyed is dependent on the type and quantity of equipment expected to be used on that site. The UXO survey crew will follow the procedures outlined in the site-specific UXO safety plan to determine the dimensions of the area to be surveyed. Normally, the width of the access route will be at least twice as wide as the widest vehicle that will use the route; footpaths will be a minimum of 3 feet wide.

Tracked or other vehicles, that disturb the soil are authorized for use only in areas that have been surveyed and no anomalies have been detected.

Erosion and weathering will typically cause some UXO items to leach to the surface or otherwise be uncovered. In cases where access corridors or sampling sites have not been surveyed or traversed for a period of time, additional UXO surveys may be required. The decision regarding the performance of additional surveys will be made by the FTMC UXO team leader and the IT FTMC UXO Safety Officer. The site superintendent will be notified of this decision. This decision will be based on, but not limited to, such factors as: the amount of time since the last survey was performed; the weather during this period; the terrain in the area of concern; and the type and quantity of UXO found during initial surveys.

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#### **4.2 Vegetation Removal**

In cases where removal of large trees or other types of vegetation is required, the following procedures will be followed:

- The UXO technician will survey around the base of the tree or vegetation, and, if no anomaly is detected, direct the bulldozer or other equipment to proceed. If an anomaly is detected, the location will be recorded and marked and another route will be selected. The size of the area to be surveyed will depend on the size of the suspected root system of the tree to be removed.
- Once the tree has been pushed over, the UXO technician will survey around the root ball and the area in and around the hole. If an anomaly is detected, the anomaly will be recorded and marked and an alternate route will be selected. If no anomaly is detected, the UXO technician will direct the equipment operator to proceed with the excavation.

#### **4.3 Road Maintenance**

Remote range roads and trails frequently require a certain amount of repair to remain passable. This section describes authorized actions regarding the maintenance of dirt or gravel range roads by IT UXO personnel.

- Bulldozers or grader-type equipment is authorized to repair roads and trails as long as a UXO survey has been performed and no anomalies have been detected.
- The UXO technician will observe the blade of the equipment as the earth is moved. If a potential UXO is uncovered, the UXO technician will signal the equipment operator to immediately stop the equipment. The UXO technician will then attempt to visually identify the object. If the object cannot be positively identified as a non-hazardous item, the equipment will be moved, the location of the object marked and recorded on the IT FTMC Unexploded Ordnance Report Form (Attachment 3), and the route changed to avoid the object. If no suspicious objects are detected, the equipment will continue to move earth at a rate of no more than one foot of depth at a time. If, more grading is required after the first pass is complete the UXO technician will perform another survey. If no anomalies are detected, the equipment can repeat the grading process. If an anomaly is detected, the operation will be halted and the route changed.

- After an area has been surveyed and no anomalies have been detected, soil can be removed at a rate of no more than one foot per lift. If additional grading is required, a survey will be performed after each one-foot increment the soil has been removed.
- Earth may not, at any time, be moved at a rate of more than one foot in each lift.

## **5.0 FTMC UXO LOG BOOKS**

All UXO team leaders or UXO technicians supporting HTRW operations will maintain a logbook. The purpose of the logbook is to record UXO actions and activities taken at each work site.

### **5.1 Responsibilities**

UXO personnel will maintain an individual daily logbook of work activities.

The logbooks will be routinely inspected weekly by the UXO QC Officer and will be made available to the FTMC site superintendent upon request. Copies will be made daily and filed in the IT Field Project office.

Logbooks will contain bound and numbered pages. Entries will be on successive pages as work is performed. The individual using the logbook will sign the page after the last entry for that page has been made. Logbooks are part of the project legal file and will be filed with the project files upon completion of each investigation.

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## 5.2 Data Requirements

As a minimum, individual logbooks will contain the following information:

- Date, time and location of UXO activities
- Personnel involved in the activities
- UXO activities performed, including UXO/anomalies found
- A description of areas swept
- A record of the magnetometer or other equipment used, including instrument serial number
- Weather conditions.

The IT FTMC QC Officer will utilize the IT FTMC “UXO Avoidance Quality Control Report” (Attachment 4) to document checks of field activities.

Additionally, UXO personnel will complete IT FTMC Form “UXO Sketch Log” (Attachment 5) and IT FTMC Unexploded Ordnance Report Form. The “UXO Sketch Log” will contain a description of activities, including the dimensions of the area surveyed. A description of the length and width will be recorded, as well as the manner in which the survey was performed. These forms will be completed as required and presented to the site superintendent.

## ATTACHMENT 1

### FTMC Employee Certification (Example)

I certify that (name of individual) has fulfilled all UXO orientation requirements and has been observed by me for a period of 3 work days and is therefore eligible to perform UXO activities at FTMC.

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Jim Kerr  
FTMC UXO Safety Officer

## ATTACHMENT 2

### Magnetometer/Metal Detector Functions Test Data Sheet

Each magnetometer and/or metal detector will receive a function test at the beginning of each workday and after changing batteries. The function test will include operating the magnetometer/metal detector over a test area developed specifically for ensuring that detection instruments are operating properly. Instruments that do not pass the function test will be tagged out until repairs are made or a replacement instrument is available.

Project Number: \_\_\_\_\_

Instrument Model: \_\_\_\_\_

Instrument Serial Number: \_\_\_\_\_

Date	Person Performing Test	Function Test Results	Remarks



## ATTACHMENT 3

### Unexploded Ordnance Report Form

Report Tracking Number:															
<b>Discovery and Reporting Time</b>															
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2">Time of Discovery</th> </tr> <tr> <td style="width: 50%; text-align: center;">Date</td> <td style="width: 50%; text-align: center;">Time</td> </tr> <tr> <td style="height: 20px;"></td> <td></td> </tr> </table>		Time of Discovery		Date	Time			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2">Time Reported to Base Transition Force</th> </tr> <tr> <td style="width: 50%; text-align: center;">Date</td> <td style="width: 50%; text-align: center;">Time</td> </tr> <tr> <td style="height: 20px;"></td> <td></td> </tr> </table>		Time Reported to Base Transition Force		Date	Time		
Time of Discovery															
Date	Time														
Time Reported to Base Transition Force															
Date	Time														
Employee Name: _____		Reported to FTMC Transitional Force Personnel													
		Name: _____													
<b>Location of Ordnance</b>															
Location, Description, and Parcel Number:															
Coordinates of Ordnance:		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2">State Plane Coordinates</th> </tr> <tr> <td style="width: 50%; text-align: center;">Northing</td> <td style="width: 50%; text-align: center;">Easting</td> </tr> <tr> <td style="height: 20px;"></td> <td></td> </tr> </table>		State Plane Coordinates		Northing	Easting								
State Plane Coordinates															
Northing	Easting														
<div style="text-align: right; margin-right: 50px;"> <table border="1" style="width: 80%; border-collapse: collapse;"> <tr> <th colspan="4">Picture Taken of Ordnance</th> </tr> <tr> <td style="width: 25%; text-align: center;">Yes</td> <td style="width: 25%; text-align: center;">No</td> <td style="width: 25%; text-align: center;">Date</td> <td style="width: 25%; text-align: center;">Time</td> </tr> <tr> <td style="height: 20px;"></td> <td></td> <td></td> <td></td> </tr> </table> </div>				Picture Taken of Ordnance				Yes	No	Date	Time				
Picture Taken of Ordnance															
Yes	No	Date	Time												
Written Description and/or Sketch of Ordnance:															
<b>Corrective Action Taken by Fort McClellan Transition Force</b>															
Date															

## ATTACHMENT 4

These standard policies and procedures are applicable to all members of The IT Group, Inc. except where superceded or modified by the member Company.

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## UXO Quality Control Report

**Project Location:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Work Site Location:** \_\_\_\_\_

**Day:** \_\_\_\_\_

**1. Personnel Involved:**

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**2. Description of Work Being Performed:**

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**3. Equipment Utilized:**

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**4. Comments:**

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**Completed By**

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**Printed Name & Title**

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**Signature**

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**Date**

## ATTACHMENT 5

### UXO Sketch Location Log

District: \_\_\_\_\_ Hole Number: \_\_\_\_\_ Date: \_\_\_\_\_

Company Name: IT Corporation

Subcontractor: \_\_\_\_\_

Parcel Location: \_\_\_\_\_ Well Location: \_\_\_\_\_ Date Started: \_\_\_\_\_ Date Completed: \_\_\_\_\_

Type of UXO Work Being Performed:

Most Probable Munition: \_\_\_\_\_

Down-Hole Depth Achieved for UXO Avoidance: \_\_\_\_\_

Total Number of Surface UXO Marked: \_\_\_\_\_

Total Number of Anomalies Marked: \_\_\_\_\_

Location Sketch/Comments:

Not to Scale

Signature of UXO Technician:

Date:

These standard policies and procedures are applicable to all members of The IT Group, Inc. except where superceded or modified by the member Company.